```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                              Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OM nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  otal number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
BG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of hits satisfying
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   length:
EST:*
                                                                                                                                                                                                                                                                                                                                                                                                                              Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IDENTITY_NUC Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-461-774-1
1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7991742 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          January 12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 agcaagctgatcgaatacga...
       gb_est10:
gb_est11:
gb_est13:
gb_est14:
gb_est15:
gb_est16:
gb_est16:
gb_est17:
gb_est19:
gb_est20:
gb_est21:
gb_est24:
gb_est24:
gb_est26:
gb_est26:
gb_est27:
gb_est27:
gb_est28:
gb_est38:
                                                                                                                                                                                                                                                                                                                                          gb_est1:*
gb_est2:*
gb_est3:*
gb_est4:*
gb_est5:*
gb_est6:*
                                                                                                                                                                                                                                                                                                                           gb_est9:*
                                                                                                                                                                                                                                                                                                                                   gb_est8:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
20000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GenCore version (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2001, 12:07:44 ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3503743858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                               summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .....accacgggcacgcgcactga 1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4.5
Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Search time 3358.72 Seconds (without alignments)
3373.639 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15983484
```

444.4 447.4 447.4 447.4 447.4 447.4 447.4 447.4 447.4 447.4 447.4 447.4 550.5 551.5 552.5 553.5 553.6 660.6

em_estro1:*
em_estro2:*
em_estro3:*

em_estov1:*
em_estov2:*
em_estp11:*
em_estp11:*
em_estp14:*
em_estp14:*

em_esthum2:*
em_esthum4:*
em_esthum5:*
em_esthum6:*
em_esthum6:*
em_esthum9:*
em_esthum11:*
em_esthum11:*
em_esthum11:*
em_esthum11:*
em_esthum11:*
em_esthum11:*
em_esthum11:*
em_esthum11:*
em_esthum11:*
em_esthum16:*
em_esthum16:*
em_esthum16:*
em_esthum16:*
em_esthum19:*

em_estro4:*
em_estro5:*
em_estro6:*
em_estro7:*

em_estro8:*
em_estro9:*
em_estro10:*

em_estrol1: *
em_estrol2: *
em_estrol2: *
em_estrol2: *
em_estrol3: *
gb_est40: *
gb_est44: *
gb_est44: *
gb_est45: *
gb_est46: *
gb_est46: *
gb_est46: *
gb_est46: *
gb_est51: *
gb_est51: *
gb_est52: *
gb_est60: *
gb_est70: *
gb_est70: *
gb_est70: *
gb_est70: *
gb_est70: *

gb_gss25:* gb_gss26:* gb_gss27:* gb_gss28:*

Description

```
em_estro19:
gb_est58:*
gb_est60:*
gb_est61:*
gb_est63:*
gb_est63:*
gb_est66:*
gb_est66:*
gb_est75:*
gb_est76:*
gb_est78:*
gb_est81:*
                       em_gss8:*
em_gss10:*
em_gss10:*
em_gss10:*
em_gss11:*
gb_gss11:*
gb_gss12:*
gb_gss13:*
gb_gss13:*
gb_gss13:*
gb_gss13:*
gb_gss14:*
em_gss15:*
gb_gss16:*
gb_gss16:*
gb_gss17:*
gb_gss18:*
gb_gss17:*
gb_gss18:*
gb_gss28:*
gb_gss18:*
gb_gss28:*
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    em_estpl6:*
em_estpl7:*
em_estpl8:*
em_estro14:*
em_estro16:*
em_estro16:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       em_gss4:*
gb_gss5:*
gb_gss6:*
gb_gss8:*
gb_gss8:*
em_gss5:*
em_gss5:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gb_est83:
gb_est84::
gb_est86::
gb_est86::
gb_est87::
gb_gss1::
gb_gss2::
gb_gss3::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     em_gss2:*
em_gss3:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      em_gssl:*
                                                                                                                      RESULT 1
CNS00YXJ/c
LOCUS
DEFINITION
ACCESSION
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                  191.4
191.8
191.8
191.8
186.8
1186.8
1186.4
177.6.4
1173.6
1171.8
1171.8
1171.8
1171.8
1171.8
1171.8
1171.8
1171.8
1171.8
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
1166.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score
                                           CNS00YXJ 1101 bp DNA GSS 26-JUL-1999
Drosophila melanogaster genome survey sequence T7 end of BAC
BACN01IZ4 of DrosBAC library from Drosophila melanogaster (fruit
fly), genomic survey sequence.
AL096961
  AL096961.1 GI:5608572 GSS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
Match
                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                  DB
                                                                                                                                                                                                                                                                                                                                                  108
6 /
105
21
21
21
21
36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1110
1111
21
1106
1106
24
134
134
197
108
116
336
90
338
326
221
221
337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   108
87
18
110
21
87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          135
12
14
135
                                                                                                                                                                                                                                                                                                                                                10 BE643470
BE318999
11 BF705255
11 BF705255
11 BF31897
24 BF31897
24 BF233897
24 BF423380
26 BF3189404
27 BF423317
28 BF423317
28 BF42317
29 BF3117
29 BF3117
20 BF3117
20 BF3117
20 BF3117
20 BF3117
21 BF31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ID
                                                                                                                                                                                                                                                                          ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUMMARIES
```

ALU96961 Drosophil
BE775558 MY 04 °C -0
BE34498 EST313562
BE34498 EST313562
BE7677047 MY 23 °H -0
BE777047 MY 23 °H -0
BE776723 MY 13 °B -0
AA820868 LD24787. 5
AA979150 LD33429. 5
BE75334 MY 01 °F -0
AM506070 GE1379 G1
A1106885 GH06135. 5
D46006 RICSL0372A
BE42226 HWM022CF
AW224051 EST300862
A1292742 GH15714. 5
BE583266 6-2D MY
AM506070 GE1379 G1
AW224051 EST300579
BE643470 CF12_8_01
AV223768 EST300579
BE643470 CF12_8_01
AV620989 AV620989
BE705255 Sc02_10c0
A51517559 GH28564. 5
BE318972 NP043C12L
A1729076 BNLGH1125
BE053039 GA_E3000
BE420380 WWS06. A2R
A1113596 GH09960. 5
AW927061 HVSNEg000
BE420380 WWS06. A2R
A1113596 GH09960. 5
AW927061 HVSNEg000
BE420380 WWS06. A2R
A1113596 GH09960. 5
AW927067 EST34399
A1486676 EST244998
AV640767 AV6436074
BE432172 EST398701
AN9907067 EST34399
A1486676 EST244998
AV640061 AV640061
AV63677 AV636074
BE432172 EST398701
A333866 SD05838. 5
A1531028 SD01884. 5
AV392414 AV9392414
A1296971 LP11105. 5

1117:
1118:
1120:
1121:
1121:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:
1122:

```
Š
                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                   Qy
                                                                                                                          밁
                                                                                                                                                          ρ
                                                                                                                                                                                                 밁
                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                 δĀ
                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE CO
                δÃ
                                                    밁
                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       824
                                                                                                                            524
                                                                                                                                                             643
                                                                                                                                                                                                   584
                                                                                                                                                                                                                                                                         644
                                                                                                                                                                                                                                                                                                         523
                                                                                                                                                                                                                                                                                                                                                                             463
                                                                                                                                                                                                                                                                                                                                                                                                                                                  406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               763
                                                       464
                                                                                                                                                                                                                                    583
                                                                                                                                                                                                                                                                                                                                            704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        883 CCATTGC-CAAGGAGGGATTCGAGAAGWTKTCACGGGGTGCCAGTCCGGTGGAGATCCGC
                                                                                                                                                                                                                                                                                                                                                                                                               764 GTTAACACGCCCGAGGAGATCTGCCAGGTGGCGACGATCTCTGCGAACGGCGACAAGTCG
                                                                                                                                                                                                                                                                                                                                                             atcggttgacctggttggcgaagcgatgaacaaggtcggccacgacagcgttgtcagcgtc
                                                                                                                                                                                                                                                                                          aaggaatcctccacgctgggcaccgagtttggagttcacccgaaggtattggcttccacaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gtgggaatcggcaaggccgccgacgcggttattcgaggcgctgctggcatcggccacgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccaccaagaccaacgatgttgccggtgacggcaccaccaccgcaaccatcttggcgcag
gcgttggcgacgctggtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaag
                                                                                                                                                  gcgttgatcctgctacaccaagaccaagatcagctcgcttcccgatctgttgccattgctg
                                                                                                                                                                                                                   ggcttcttgtcggcatacttcgttaccgacttcgataaccagcaggcggtgctcgaggac
                                                                                                                                                                                                                                                                                                                                                                                                                                     gtgtccggcaagaccggcatcgcccaggtggcgacggtgtcctcg---cgcgacgagcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGCGGAGTTATGCTAGCCATCGAGACGGTCAAGGACAACCTTCGTCGGTTGTCCCGGCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcactgatcaagggcggcctgaggctagtggccgccggcgtcaacccggtcggcgtcggc
                                                     GAKTTGGCCAACGCTCAGCGCAAGCCYTTGTTYATTATCGCTGAGGACTTGGAGGCGGAG
                                                                          gaaaaggttgcaggaacgggtaagccactactgatcgtggctgaagacgtggagggcgaa
                                                                                                                                                                                                 GGTTACATTTCGCYTTAYTTTATTAACACCTCCAAGGGAGCAAAGGTGGAGTTCCAGGAC
                                                                                                                                                                                                                                                                     AAGGATGGCAAGACCCTTTGCGACGAACTGGAGGTGATCGAGGGCATGAAATTTGACCGT
                                                                                                                                                                                                                                                                                                                                          GTGGGAAACCTCATCAGCGAGGCCATCAAGAAGGTGGGTCGAGACGGCGTTATCACTGTC
                                                                                                                          GCGCTTCTCCTYTTTTGCGAGAAKAAAATCAAGTCGGCACCTAGCATCGTGCCTGCCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       473;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    - Web: www.genoscope.cns.fr)

Determination of this BAC-end sequence was carried out as part of a collaboration with the European Drosophila Genome Project (EDGP) - http://www.edgp.ebi.ac.uk - This Drosophila melanogaster BAC library (Dros BAC) was made by Alain Billaud at CEPH (Centre d'Etude du Polymorphisme Humain) with funding provided by a MRC project grant. The DNA was prepared from embryos by Alain Bucheton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Direct Submission
Submitted (23-JUL-1999) Genoscope - Centre
BP 191 91006 EVRY cedex - FRANCE (E-mail :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

[ (bases 1 to 1101)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PBeloBAC11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Genoscope.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Genevieve Payan. It has been constructed in the vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="end : T7"
313 c 254 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Drosophila melanogaster"
plasmid="pBeloBAC11"
plasmid="taxon:7227"
/db_xref="taxon:7227"
/clone_lib="DrosBAC"
/clone="BACN01124"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .1101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 195.2; DB 190; Lengt
Pred. No. 7.6e-33;
4; Mismatches 397; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    National de Sequencage : segref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8;
                                                     405
                                                                                                                          465
                                                                                                                                                             702
                                                                                                                                                                                                 525
                                                                                                                                                                                                                                                                       585
                                                                                                                                                                                                                                                                                                                                          645
                                                                                                                                                                                                                                                                                                                                                                             522
                                                                                                                                                                                                                                                                                                                                                                                                               705
                                                                                                                                                                                                                                                                                                                                                                                                                                                  462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.
```

Вр δÃ

89 GCAAGGACATCCGCCTCCGCCGCGAAGGTCCGGCCCGCTATGCTTAAGGGCGCGCGGATCAGC 148

2 gcaagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagc 61

Matches

Local Similarity

Score 194; DB 135; Pred. No. 1.4e-32;

Mismatches

225;

Indels Length

4.

Gaps

2;

671;

Conservative

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
BE775585
                                                                         BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
MEDLINE
Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1060
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1000
                                                                                                                                                                                                                                                                                                                                                 source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                940
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggcaccgcagaagcggtggccaaccgggcgaaccacttgcgtgccgagatcgacaagagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GACTTCCTCCTACGAGAAGGAGAAGATGCAAGAGCGCTTGGCCCSCCTCTCY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGACAGAAGGCAGAGGTGGAGAAAAGGGTCGAGGGTCTGCGCGAGGCCATAAAAAAAGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTTGGACGTKTAGGCGAGGTAGTAGTCTCGAAAGACGACACAATGCTGCTCAAGGGCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGAATCKTKTTTGGAGACGAAGCCAATATGGTACGGCTCGAGGATATCAAGATGAGCGAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggccacgtggtcaaccccgacgccggcattgtgctgcgcgagg---tgggcttggaygtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gggccgtacttcggtgaccgccgtaaggcgttccttgaggacctggcggtggtgacgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCACTCAGCACTYTGKTGKTGAACCGCCTAAAGGTGGGCCTCCAAGTGTGCGCGGTGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCACCCGKTTTTGGTGACAATCGCAAGGAGAATYTGATGGACATGGCCGTGGCCCACCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                     Tel:
                                                                                                                                                                                                                                                                                                                                                                                                                                    Contact: Govers F
Laboratory of Phytopathology
Wageningen University
Binnenhaven 9, P.O.Box 8025, 6700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fungal G
20056376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BE775585 671 bp
MY-04-C-01 PinfestansMY
BE775585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Kamoun, S., Hraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Initial assessment of gene diversity for the comycete
Phytophthora infestans based on expressed sequences
Fungal Genet. Biol. 28 (2), 94-106 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Eukaryota; stramenopiles; Oomycetes; Pythiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Phytophthora infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              potato late blight agent.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BE775585.1 GI:10229240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1
                                                                                           136
                                                                                                                                                                                                                                                                                                                                                                                                    31 317 483 138
31 317 483 412
                                                                                 /strain="DDR7602, Al mating type"
/db_xref="taxon:4787"
/clone_lib="pinfestansMY"
/clone_lib="pinfestansMY"
/dev_stage="4-week old vegetative, non-sporulating
mycelium in synthetic medium"
/lab_host="E. coll, strain DH5-alpha"
/lab_host="E. coll, strain DH5-alpha"
/note="vector: pSPORT1; Site_1: SalI; Site_2: NotI; Total
RNA was isolated from mycelium of P. infestans DDR7602
cultured for 4 weeks in synthetic medium. EST clones were
named by their position in the microtiter plate, preceded
by the prefix MY (for mycelial) and the successive number
of the microtiter plate (e.g. MY-06-A-04)."
                                                                                                                                                                                                                                                                                                                                                                                 Francine.Govers@medew.fyto.wau
                                                                                                                                                                                                                                                                                                           /organism="Phytophthora infestans
/strain="DDR7602, Al mating type"
                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         to 671)
12.0%;
60.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                        EE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                      Wageningen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nuss, D. and Govers,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cDNA, mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pythiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                      The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                53
                                                                                                                                                                                                                                                                                                                                                                                                                                        Netherlands
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pathogen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          285
```

0,

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BE344498/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                       COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                     TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gcatcgcgcaggtggcgacggtgtcctcgcgc---gacgagcagatcggtgacctggttg 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ccgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccg 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tgggcaccg-agttggagttcaccgaaggtattggcttccac 579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTGACGCCATGGAGCGCGTGGGCAAGGAGGGCCGTGATCACGGTGCAGGATGGCAAGACGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gcgaagcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgc 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGGTGGCCCAGGTGGCCACCATCTCGGCCAACTCGGAGACGGAGATCGGCAACCTCATCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcctgaggctagtggccggcgcgcgctcaacccggtcgcgctcggcgtgggaatcggcaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            atgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aagatccgtttgaagacttgggcgcccagctggtgaagtcggtggcgccaccaagacccaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TGTACAACGAAGCTGGAGGTGGTCGAGGGCATGAAATTCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGTGGACCACGTCGTGGACGGTCTGCAGAAGCTGTCGATGGACGTGGCCGACAAGGAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCTGCAAGTCGGTGGCCGCCGGCATGAACCCCCACGGACCTGCGCCGCCGCGCATCCAAATGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TGGCCAACGCCGTGCAGGTGACCTTGGGCCCCCAAGGGCCGTAACGTGGTCATTGACCAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACGCGGCCGGTGACGGCACCACGTCGGCCACGGTGCTGACGCGCCCATCTTCAGCGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AGGACAAGTTCGAGAACATGGGCGCGCAACTCGTGCGCTCGGTGGCCAGCAGCACCAACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGTACGGCGCTCCCAAGATCACCAAGGACGGTGTGACTGTGGCCCGCAGCATTGACTTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tggccgacaccgtgcgggtgacgctggggccgcgcggcatgtggtgctggccaagg 121
                                                                                                                                                                                                                                                                             1 (bases 1 to 579) wan der Hoeven, R.S., Garvin, D., Matern, A.L., Holt, T.E., Liang Upton, J., Hansen, T., Craven, M.B., Bowman, C.L., Ahn, S., Ronnin, Fraser, C.M., Martin, G.B., Giovannoni, J.J. and Tanksley, S.D. Generation of ESTs from tomato root tissue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE344498 5/9 pp ......
EST313562 tomato root, plants
                                                                                                                                                            Clemson University Genomics Institute
Clemson University
100 Jordan Hall, Clemson, SC 29634, US
Tel: 864 656 4366
Fax: 864 656 4293
                                                                                                                                                                                                                                                     Contact: David Frisch
                                                                                                                                                                                                                                                                                                                                                              Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyjedons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum; Lycopersicon.

1 (bases 1 to 579)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BE344498.1
EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lycopersicon
BE344498
                                                                                                                                                                                                                                                                   Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                Lycopersicon esculentum
                                                                                                                             prime
                                                                                                                                             dfrisch@CLEMSON.EDU
/organism="Lycopersicon es
/cultivar="TA496"
/db_xref="taxon:4081"
/clone="cLEY7A23"
/clone_lib="tomato root, p
                                                                                                                             sequence.
                                                                                            Location/Qualifiers
1. .579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GI:9253999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EST s pre-anthesis, clone cLEY7A23,
                                                                                                                                                                                               29634, USA
                                                                         esculentum'
   plants
   pre-anthesis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17-JUL-2000
1, Cornell University
3, mRNA sequence
                                                                                                                                                                                                                                                                                                                     Ronning, C
     Cornell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   268
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                       ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                          LOCUS
DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 4
BE344505/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORIGIN
                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                                                                       KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BASE COUNT
                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                       ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14 aatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctggccgacacccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             acggcaccaccaccaccatcttggcgcaggcactgatcaagggcggcctgaggctag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgatgttgccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaagatccgtttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAGGTACCATATACT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TCGTTGCCGAACTGAAGAACCTGTCCAAGCCATGCGCCGACTCCAAGGCCATCGCCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggcatcgcgcagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tgcgggtgacgctggggccgcgcggccggcatgtggtgctggccaaggcgtttggcgac 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AATTTGGTGATTCCGCTCGTAAGAAAATGCTGGTTGGTGTCAACGTTCTGGCTGACGCGG 386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACGGCACCACCACCGCTACCGTTCTGGCTCAGGCCATCGTCAACGAAGGCCTGAAAGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAAACATGGGCGCCCAGCTGGTCAAGGAAGTTGCTTCCAAGGCCAACGACGCTGCCGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGACCATCACCAAGGACGGCGTTTCCGTCGCCAAAGAAATCGAGCTGAAAGACGCTTTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TAAAAGCGACCCTGGGCCCGAAAGGCCGTAACGTGGTACTGGCCAAGAGCTTCGGCGCGC 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tggcgacggtgtcct 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              283;
Email:
5 prime
                                                                                                                                                1 (bases 1 to 597)
van der Hoeven, R.S., Garvin, D., Matern, A.L., Holt, I.E., Upton, J., Hansen, T., Craven, M.B., Bowman, C.L., Ahn, S., I, Fraser, C.M., Martin, G.B., Giovannoni, J.J. and Tanksle; Generation of ESTs from tomato root tissue
                                                                 Clemson University
100 Jordan Hall, C
                                                                                                                                                                                                                                  Lycopersion esculentum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eddicotyledons; core eudicots; Asteridae; euasterids
I; Solanales; Solanaceae; Solanum; Lycopersicon.
                                                                                                                                                                                                                                                                                                                                                       BE344505 597 bp mRNA EST 17-JUL-2000 EST313569 tomato root, plants pre-anthesis, Cornell University Lycopersicon esculentum cDNA clone cLEY7C23, mRNA sequence. BE344505
                               Tel: 864 656 4366
Fax: 864 656 4293
                                                                                                Clemson University Genomics
                                                                                                                  Contact: David Frisch
                                                                                                                                                                                                                                                                                                                          EST
                                                                                                                                     Unpublished (1999)
                                                                                                                                                                                                                                                                                                         tomato.
                                                                                                                                                                                                                                                                                                                                        BE344505.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
prime
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                   dfrisch@CLEMSON.
 sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /tissue_type="root"
/dev_stage="plants in pre-anthesis stage"
/dev_stage="plants in pre-anthesis stage"
/note="vector: pBlueScript SK(-); Site_1: E
Xho1; supplier: Tanksley; Tissue supplied
(USDA-ARS, Ithaca, NY 14850)."

a 155 c 170 g 145 t
                                                                                                                                                                                                                                                                                                                                        GI:9254006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11.9%;
65.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11
                                                                  Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 191.8; DB 1
Pred. No. 4.1e-32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches 152; Indels
                                                                  SC
                                                                                                    Institute
                                                                  29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                     Tanksley, S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EcoR1; Site_
d by Dave Gar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                   Ronning, C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            73
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
BE777047
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÕ
                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                               COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                          KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                  JOURNAL MEDLINE
                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query
Best [
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Match
Local Similarity 65.1
aes 282; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaagatccgtttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctggccgacaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggcatcgcgcagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggccgccgacgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          acggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggcctgaggctag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aagaCttgggcgcccagctggtgaagtcggtggccaccaagaccaacgatgttgccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TAAAAGCGACCCTGGGCCCGAAAGGCCGTAACGTGGTACTGGCCAAGAGCTTCGGCGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgcgggtgacgctggggccgcgcggcatgtggtgctggccaaggcgtttggcggac 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AATTTGGTGATTCCGCTCGTAAGAAAATGCTGGTTGGTGTCAACGTTCTGGCTGACGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TAGGTACCATCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tggcgacggtgtc 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TCGTTGCCGAACTGAAGAACCTGTCCAAGCCATGCGCCGACTCCAAGGCCATCGCCCAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TCGCTGCCGGCATGAACCCGATGGACCTGAAGCGCGGTATCGACAAGGCCACTGCTGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAAACATGGGCGCCCAGCTGGTCAAGGAAGTTGCTTCCAAGGCCAACGACGCTGCCGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGACCATCACCAAGGACGGCGTTTCCGTCGCCAAAGAATCGAGCTGAAAGACGCTTTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACGGCACCACCACCGCTACCGTTCTGGCTCAGGCCATCGTCAACGAAGGCCTGAAAGCCCG
Contact: Govers F
Laboratory of Phytopathology
                                                                                                                                                                1 (bases 1 to 63/)
1 (bases 1 to 63/)
Kamoun, S., Hraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Hraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Hraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Hraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and Gov
Kamoun, S., Haraber, P.T., Sobral, B.W.S., Nuss, D. and B.W.S., Nuss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MY-23-H-09
BE777047
                                                                                                                 Phytophthora infestans Fungal Genet. Biol. 28
                                                                                                                                                                                                                                                                                                                                                                                potato late blight agent.
Phytophthora infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BE777047.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BE777047
                                                                                  20056376
                                                                                                                                                                                                                                                                                                             Phytophthora.
                                                                                                                                                                                                                                                                                                                                             Eukaryota; stramenopiles; Oomycetes; Pythiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Lycopersicon e:
/cultivar="TA496"
/db_xref="taxon:4081"
/clone="cLEY7C23"
/clone_lib="tomato root, p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /dev_stage="plants in pre-anthesis stage" |
//note="Vector: pBlueScript SK(~); Site_1: |
//note="Vector: pBlueS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
1. .597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                University"
/tissue_type="root"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PinfestansMY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GI:10230702
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11.8%;
65.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   dq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 191.4; DB 107
Pred. No. 5e-32;
0; Mismatches 151;
                                                                                                                 based on expressed sequences (2), 94-106 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               esculentum'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      plants
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pre-anthesis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDNA,
                                                                                                                                                                                                                                                                                                                                             Pythiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20-SEP-2000
                                                                                                                                                                                                                                   Govers, F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EcoR1;
d by Dav
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                        pathogen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R1; Site_2:
Dave Garvi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cornell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Garvin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
```

```
VERSION
KEYWORDS
                                           DEFINITION ACCESSION
                                                                                          RESULT
BE776273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BASE CO
                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                      Ъ
                                                                                                                                                                                  Qy
                                                                                                                                                                                                                  Вр
                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
SOURCE
                                                                             Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source
                                                                                                                                                        576
                                                                                                                                                                                                                    516
                                                                                                                                                                                                                                                  422
                                                                                                                                                                                                                                                                                                                                                                          302
                                                                                                                                                                                                                                                                                                                                                                                                           336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    216
                                                                                                                                                                                                                                                                                                              362
                                                                                                                                                                                                                                                                                                                                             396
                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            96
                                                                                                         σ
                                                                                                                                                                     cgaagcgatgaacaaggtcggccacgacagcgtggtcagcgtcaagga
                                                                                                                                                                                                                                     gcatcgcgcaggtggcgacggtgt--cctcgcgcgacgagcagatcggttgacctggttgg
                                                                                                                                                                                                                                                                                                                                                             gcctgaggctagtggccggcgtcaacccggtcgcgctcggcgtgggaatcggcaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aagatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gcaagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagc
                                                                                                                                                                                                                                                                                                   ccgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccg
                                                                                                                                                                                                                                                                                                                                                                                                                           atgttgccggtgacgccaccaccgcaaccatcttggcgcaggcactgatcaagggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AGGACAAGTTCGAGAACATGGGCGCGCAACTCGTGCGCTCGGTGGCCAGCAGCACCAACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCAAGGACATCCGCTTCGGCGTGGAAGGTCGGGCCGCTATGCTTAAGGGCGCGGATCAGC
                                                                                                                                                                                                                    AGGTGGCCCANGTGGCCACCATCTCGCCAACTCGGAGACGGAGATCGGCAACCTCATCAG
                                                                                                                                                                                                                                                                              CCGTGGACCACGTCGTGGACGGTCTGCAGAAGCTGTCGATGGACGTGGCCGACAAGGAGA
                                                                                                                                                                                                                                                                                                                                             GCTGCAAGTCGGTGGCCGGCATGAACCCCACGGACCTGCGCCGGCGATCCAAATGG
                                                                                                                                                                                                                                                                                                                                                                                                           ACGCGGCCGGTGACGGCACCACGTCGGCCACGGTGCTGACGCGCGCCCATCTTCAGCGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGTACGGCGCTCCCAAGATCACCAAGGACGGTGTGACTGTGGCCCGCAGCATTGACTTCC
                                                                                                                                                      TGACGCCATGGANCGCGTGGGCAANGANGGCGTGATCACGGTGCAGGA
                                           BE776273 635 bp
MY-13-B-06 PinfestansMY
BE776273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Wageningen University
Binnenhaven 9, P.O.Box 8025,
Tel: 31 317 483 138
Fax: 31 317 483 412
                EST
                             BE776273.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Francine.Govers@medew.fyto.wau.nl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /dev_stage="4-week old vegetative, non-sporulating mycelium in synthetic medium"
//lab_host="E. coli, strain DH5-alpha"
/note="Vector: pspORT1; Site_1: SalI; Site_2: NotI; Total RNA was isolated from mycelium of P. infestans DDR7602 cultured for 4 weeks in synthetic medium. EST clones were named by their position in the microtiter plate, preceded by the prefix MY (for mycelial) and the successive number of the microtiter plate (e.g. MY-06-A-04)."

a 198 c 210 g 97 t 4 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /ob_xref="taxon:4787"
/db_xref="taxon:4787"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /clone_lib="PinfestansMY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Phytophthora infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 186.8; DB 1
Pred. No. 5.1e-31;
                                                           Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      type"
                                                           infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Wageningen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                          CDNA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The
                                                                            20-SEP-2000
                                                          mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Netherlands
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                515
                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                           455
                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                           395
                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲.
```

potato

Late

blight agent

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
MEDLINE
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
                                                       516
                                                                                                                                                                                                                                302
                    479
                                                                                                                           456
                                                                                                                                                          362
                                                                                                                                                                                                396
                                                                                                                                                                                                                                                                   336
                                                                                                                                                                                                                                                                                                     242
                                                                                                                                                                                                                                                                                                                                       276
                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                156
                                                                                                                                                                                                                                                                                                                                                                                                           216
                                                                                                                                                                                                                                                                                                                                                                                                                                            122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tocal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcaagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggccatggacaagc 61
                                                                         gcatcgcgcaggttggcgacggttgtcctcgcgc---gacgagcagatcggttgacctggttg 478
                                                                                                                                           ccgccgacgcggtattcgaggcgtgctggtaggcatcggcacgccggtgtccggcaagaccg
                                                                                                                                                                                                                 atgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcg
                                                                                                                                                                                                                                                                                                                                                         aagatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacg
                                                                                                                                                                                                                                                                                                                                                                                                                         cytttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tggccgacaccgtgcgggtgacgctggggccgcgggccggcatgtggtgctggccaagg 121
gcgaagcgatgaacaaggtcggccacgacagcgtggtcagcgtcaagga
                                                     AGGTGGCCCAGGTGGCCACCTCGGCCAACTCGGAGACGGAGATCGGCAACCTCATCA
                                                                                                                                                                                             GCTGCAAGTCGGTGGCCGCCGGCATGAACCCCCACGGACCTGCGCCGCCGCGCATCCAAATGG
                                                                                                                                                                                                                                                                   ACGCGGCCGGTGACGCCACGTCGGCCACGGTGCTGACGCGCGCCCATCTTCAGCGAGG
                                                                                                                                                                                                                                                                                                                                       AGGACAAGTTCGAGAACATGGGCGCGCAACTCGTGCGCTCGGTGGCCAGCAGCACCAACG
                                                                                                                                                                                                                                                                                                                                                                                                           CGTACGGCGCTCCCAAGATCACCAAGGACGGTGTGACTGTGGCCCGGCAGCATTGACTTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TGGCCAACGCCGTGCAGGTGACCTTGGGCCCCAAGGGCCGTAACGTGGTCATTGACCAGT
                                                                                                                         CCGTGGACCACGTCGTGGACGGTCTGCAGAAGCTGTCGATGGACGTGGCCGACAAGGAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCAAGGACATCCGCTTCGGCGTGGAAGGTCGGGCCGCTATGCTTAAGGGCGCGCGGATCAGC 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Laboratory of Phytopathology
Wageningen University
Binnenhaven 9, P.O.Box 8025, 6700
Tel: 31 317 483 138
Fax: 31 317 483 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Kamoun,S., Hraber,P.T., Sobral,B.W.S., Nuss,D. and Govers,F. Initial assessment of gene diversity for the oomycete pathogen Phytophthora infestans based on expressed sequences Fungal Genet. Biol. 28 (2), 94-106 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Phytophthora infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Contact: Govers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Francine.Govers@medew.fyto.wau.nl.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /lab_host="E. coli, strain DH5-alpha"
//note="Vector: psPoRT1; Site_1: Salt; Site_2: NotI; Total
RNA was isolated from mycelium of P. infestans DDR7602
cultured for 4 weeks in synthetic medium. EST clones were
named by their position in the microtiter plate, preceded
by the prefix MY (for mycelial) and the successive number
of the microtiter plate (e.g. MY-06-A-04)."

a 199 c 214 g 94 t 1 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mycelium in synthetic medium"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Phytophthora infestans"
/strain="DDR7602, A1 mating type"
/db_xref="taxon:4787"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /dev_stage="4-week old vegetative, non-sporulating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /clone_lib="PinfestansMY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  stramenopiles; Oomycetes; Pythiales; Pythiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  to 635)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 185.6; DB 1
Pred. No. 9.3e-31;
0; Mismatches 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EE, Wageningen, The Netherlands
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             635;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             215
                                                                                                                                                                                             455
                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                   395
                                                                                                                                                                                                                                                                                                                                     335
                                                                                                                                                                                                                                                                                                                                                                                                           275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE COUNT
ORIGIN
                õ
                                                     밁
                                                                                  δõ
                                                                                                                       Вр
                                                                                                                                                        Q
                                                                                                                                                                                           Ър
                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AA820868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local S
Matches 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               source
                                                                                                                                                                                                                                138
                  318
                                                                                                                         355
                                                                                                                                                            198
                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                 235
                                                                                                                                                                                                                                                                                                                                     175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                576 GTGACGCCATGGAGCGCGTGGGCAAGGAGGGCGTGATCACGGTGCANGA
                                                                                                                                                                                                                                                                                                  78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EST
```

20

뫄 γΩ В δÃ

õ 밁

δõ 밁 DЬ

Ş

Q

Q

```
Local Similarity
nes 337; Conserv
cgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggccgccgacgcggtatt 377
                                                                                           caccaccaccgcaaccatcttggcgcaggcactgatcaagggcggcctgaggctagtggc 317
                                                                                                                                                                             AATCACCAAGGACGGCGTCACTGTGGCCCAAGTCCATTGAGCTGAAGGACAAGTTCCAGAA
                                                                                                                                                                                                                                                                 ggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaagatccgtttgaaga
                                                                                                                                                                                                                                                                                                                                AGTGACCATGGGCCCCAAGGGTCGCAATGTGATCATTGAGCAGTCGTGGGGCTCGCCCAA 294
                                                                                                                                                                                                                                                                                                                                                    CGGACCCGAGGTGCGCGCCATGATGCTCCAGGGCGTCGATGTGCTGGCCGATGCTGGC 234
                                                                                                                                                                                                                                                                                                                                                                                                                                    cgaaaccgcgcgtcgcgccatggaggtc---ggcatggacaagctggccgacaccgtgcg
                                                                                                                                                         CATCGGTGCCAAGCTGGTCCAGGATGTGGCCAACAATACCAACGAGGAGGCCGGTGATGG
                                                                    CACCACCACGGCCACCGTTCTGGCTCGCGCCATTGCCAAGGAGGGCTTCGAGAAGATCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   539 LSA, Berkeley, CA 94720-3200, Fax: 510 643 9947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Drosophila melanogaster
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta;
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 740)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA820868 740 bp mRNA EST 25-NOV-1998 LD24787.5prime LD Drosophila melanogaster embryo pOT2 Drosophila melanogaster cDNA clone LD24787 5prime similar to X99341: Hsp60 FBgn0015245 PID:e254159, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BDGP/HHMI Drosophila EST Project Unpublished (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AA820868
AA820868.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Plate: 247 row: H column: High quality sequence stop:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Email: http://www.fruitfly.org/EST, hit genomic sequence AC004116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          G. M. Rubin-Molecular and Cell Biology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Contact: Harvey, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Harvey,D., Hong,L., Evans-Holm,M.,,P., Lewis,S. and Rubin,G.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fruit fly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               POT2.
204 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         XhoI; Sized pOT2. "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone="LD24787"
/clone_lib="LD Drosophila melanogaster
/sex="male and female"
/sex="male and female"
/dev_stage="0 to 24 hours mixed stage e
/lab_host="xLl Blue"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Organ: embryo; Vector: pOT2; Site_1: ECORI; Site_2:
XhoI; Sized fractionated cDNAs were directly ligated into
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GI:2890736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11.0%;
59.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 178.4; DB 12;
Pred. No. 3.5e-29;
0; Mismatches 221;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3
682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pendleton, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          est@fruitfly.berkeley.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         embryonic"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 embryo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Su,C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          740;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 por2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Brokstein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                         414
                                                                                                                                                                                                 257
                                                                                                                                                                                                                                             354
                                                                                                                                                                                                                                                                                     197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ņ
```

```
ESULT
A979150
LOCUS
                Qy
                                                밁
                                                                                                                                                                                            BASE COUNT
ORIGIN
                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                р
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                    Source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                Matches
                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AUTHORS
                                                 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   438
                                                                                                                Local Si
hes 335;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 475
                78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         œ
ggtgacgctggggccggcggcatgtggtgctggccaaggcgtttggcggacccac
                                                                  cgaaaccgcgcgtcgcgccatggaggtc---ggcatggacaagctggccgacaccgtgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CACCATCTCGGCCAACGGTGATCAGGCCATCGGCAATCTCATCAGCGAGGCCATGAAGAA
                                                CGGACCCGAGGTGCGCGCCATGATGCTCCAGGGCGTCGATGTGCTGGCCGATGCTGTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGTTATCGAGGGCATGAAGTTCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gttcaccgaaggtattggcttcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGTGGGACGCGATGGCGTTATCACCGTCAAGGATGGCAAGACCCTCACCGATGAGTTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99tcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggcaccgagttgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gacggtgtcctcgcgcgacgagcag----atcggtgacctggttggcgaagcgatgaacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgaggcgctgctggcatcggccacgccggtgtccggcaagaccggcatcgcgcaggtggc 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAAGGGCGCCAATCCCGTCGAGATTCGTCGCGGTGTCATGCTGGCCGTTGAGACCGTCAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGACAACCTTAAGACCATGTCGCGCCCCGTTAGCACGCCCGAGGAGATCGCCCAGGTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          melanogaster
FBgn0015245 P
AA979150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AA979150 728 bp mRNA EST 24-NOV-1998
LD33429.5prime LD Drosophila melanogaster embryo poT2 Drosophila
melanogaster cDNA clone LD33429 5prime similar to X99341: Hsp60
FBgn0015245 PID:e254159, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                  High
                                                                                                                                                                                                                                                                                                                                                                                                                                 Email: http://www.fruitfly.org/EST, hit genomic sequence AC004116 Plate: 334 row: C column: 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             G. M. Rubin-Molecular and Cell Biology
University of California Berkeley
539 LSA, Berkeley, CA 94720-3200, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Contact: Harvey, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BDGP/HHMI Drosophila EST Project Unpublished (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Harvey,D., Hong,L., Evans-Holm,M.,,P., Lewis,S. and Rubin,G.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Muscomorpha; Ephydroidea;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AA979150.1
                                                                                                               Similarity 59.6
35; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fruit fly.
                                                                                                                                                                                                             160
                                                                                                                                                                                                                                                                                                                                                                                                                  quality sequence stop: 673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 510 643 9947
                                                                                                                                                                                              POT2.
203 c
                                                                                                                                                                                                                                         XhoI;
                                                                                                                                                                                                                                                                    /clone_lib="ID Drosophila melanogaster embryo po'/sex="male and female"
/sex="male and female"
/dev_stage="0 to 24 hours mixed stage embryonic"
/lab_host="%xl1 Blue"
                                                                                                                                                                                                                                                                                                                                    /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone="LD33429"
                                                                                                                                                                                                                                                          /note="Organ: embryo; Vector:
                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GI:3156555
                                                                                                                             10.9%;
                                                                                                                                                                                                                               Sized
                                                                                                                                                                                                                                         fractionated cDNAs
                                                                                                             Score 176.4; DB 14.
Pred. No. 9.6e-29;
0; Mismatches 221;
                                                                                                                                                                                                             214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   578
                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Drosophilidae;
                                                                                                                                                                                                           151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pendleton, J.,
                                                                                                                                            DB 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 est@fruitfly.berkeley.edu
                                                                                                                                                                                                                                                        pOT2;
                                                                                                                                                                                                                                         were
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Drosophila
                                                                                                               Indels
                                                                                                                                            Length
                                                                                                                                                                                                                                      Site_1: EcoRI; Site_2:
directly ligated into
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Su,C.,
                                                                                                                                              728;
                                                                                                               6;
                                                                                                                                                                                                                                                                                                                    por2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Brokstein
                                                                                                             Gaps
                                                226
                                                                               77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               594
                                                                                                               2
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
BE775334
                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM
                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gttcaccgaaggtattggcttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gacggtgtcctcgcgcgacgagcag---atcggtgacctggttggcgaagcgatgaacaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | cgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggccgccgacgcggtatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caccaccaccgcaaccatcttggcgcaggcactgatcaagggcggcctgaggctagfggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cttgggcgcccagctggtgaagtcggtggccaccaagaccaacgatgttgccggtgacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaagatccgtttgaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGTTATCGAGGGCATGAAGTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CACCATCTCGGCCAACGGTGATCAGGCCATCGGCAATCTCATCAGCGAGGCCATGAAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGACAACCTTAAGACCATGTCGCGCCCCGTTAGCACGCCCGAGGAGATCGCCCAGGTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cyaggcyctyctygcatcyyccacyccyytytccyycaagaccyycatcycycagytyyc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CAAGGGCGCCAATCCCGTCGAGATTCGTCGCCGTGTCATGCTGGCCGTTGAGACCGTCAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CACCACCACGGCCACCGTTCTGGCTCGCGCCATTGCCAAGGAGGGCTTCGAGAAGATCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CATCGGTGCCAAGCTGGTCCAGGATGTGGCCAACAATACCAACGAGGAGGCCGGTGATGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGTGGGACGCGATGGCGTTATCACCGTCAAAGATGGCAAGACCCTCACCGATGAGTTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AATCACCAAGGACGGCGTCACTGTGGCCAAGTCCATTGAGCTGAAGGACAAGTTCCAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AGTGACCATGGGCCCCAAGGGTCGCAATGTGATCATTGAGCAGTCGTGGGGCCTCGCCCAA 286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Laboratory of Phytopathology Wageningen University Binnenhaven 9, P.O.Box 8025,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Kamoun, S., Hraber, P.T., Sobral, B.W.S., Nuss, D. and Govers, F. Initial assessment of gene diversity for the comycete pathogen Phytophthora infestans based on expressed sequences Fungal Genet. Biol. 28 (2), 94-106 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Contact: Govers F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    potato late blight agent.
Phytophthora infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MY-01-F-07 PinfestansMY
BE775334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BE775334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20056376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; stramenopiles; Oomycetes; Pythiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1
                                                                                                                                                                                                                                                                                                                                                                                                                      31 317 483 138
31 317 483 412
                                                                                                                                                                                                                                                                                                                                                                                                 Francine.Govers@medew
                          /dev_stage="4-week old vegetative, non-sporulating mycelium in synthetic medium"
/lab host="E. coli, strain DH5-alpha"
/note="Vector: pSPORT1; Site_1: Sal1; Site_2: Not1; Total
/note="Vector: pSPORT1; Site_1: Sal1; Site_2: Not1; Site_1: Sal1; Site_
by the prefix MY (for mycelial) and the
                                                                                                                                                                                                                      /strain="DDR7602, A1 mating
/db_xref="taxon:4787"
/clone_lib="PinfestansMY"
                                                                                                                                                                                            /dev_stage="4-week old
                                                                                                                                                                                                                                                                                                          /organism="Phytophthora
                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
1. .637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GI:10229044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   to 637)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       637 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6700
                                                                                                                                                                                                                                                                                                                                                                                              tyto.
                                                                                                                                                                                                                                                                                                             infestans'
                                                                                                                                                                                                                                                                                                                                                                                           .wau.nl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (F)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             infestans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wageningen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDNA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pythiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The
  successive number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Netherlands
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           646
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             257
```

```
RESULT 10
AW506070
CUS
FINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                      COMMENT
                                                                                                                                                                                                                                 SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                       REFERENCE
                                                                                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                                                                                             VERSION
                                                                                                                                                                                                                                                                                         ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 307
                                                                                                   JOURNAL
                                                                                                                                               TITLE
                                                                                                                                                                         AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNT
                                                                                                                                                                                                                                                                                                                                                                                                         575
                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N
                                                                                                                                                                                                                                                                                                                                                                                                                            gcgaagcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aagatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagacccaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gcaagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagc 61
        Nematology Department
Scottish Crop Research Ins
Invergowrie, Dundee, DD2 5
Tel: 44 1482 562731
Fax: 44 1382 56245
                                                                                                                                                                                                                                                                                                                                                                                                       NTGACCCCATGGAACNCCTGGGCAAGGAAGGCGTNATCNCNGTGCAGGATGGCAACACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAGTGGCCCAAGTGGCCACCATCTCGGCCAACNCGGANANNGANATNGGCAACCTCATCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gcatcgcgcaggtgggacggtgtcctcgcgc---gacgagcagatcggtgacctggttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGTGGACCACNTCNTGGACGGTCTGCAAAAACTGTCGATGGACGTGGCCNACAAAGANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACGCGGCCGGTGACGCCACCACTTCGGCCACGGTGCTGACGCNCGCCATCTTCANCGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 atgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ANNACAANTTCNAAAACATGGGCGCGCAACTCGTGCGCTCGGTGGCCANCANCACCAACN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGTACGGCGCTCCCAANATCACCAAGGANNGNGTGGCTGTGGCCCGCANCATTGACTTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGGCCAACNCCGTGCAGGTGACCTTGGGCCCCAAGGGCCGTAACGTGGTCATTGACCAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tggccgacaccgtgcgggtgacgctggggccgcgcgggcatgtggtggtggtcgaagg 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCAAGGACATCCGCTTCGGCGTGGAAGGTCGGGCCGCTATGCTTAAGGGCGCGGATCAGC 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         al Similarity 56. 307; Conservative
                                                                                                                                                                                                                                                                                      AW506070 700 bp mRNA
GE1379 Globodera rostochiensis J2
cDNA similar to Chaperonin, hsp60,
AW506070
                                                                                                  expressed sequence tag
Unpublished (2000)
                                                                                                                             Analysis of genes expressed in second stage juveniles of the cyst nematodes Globodera rostochiensis and G. pailida using t
                                                                                                                                                          Popeijus, H., Blok, V.C., Bakker, E., , H., Smant, G. and Jones, J.T.
                                                                                                                                                                                     Eukaryota; Metazoa; Nematoda; Chromadorea; Tylenchida; Tylencholdea; Heteroderidae; Heteroderinae; Globodera. 1 (bases 1 to 700)
                                                                                                                                                                                                                                 Globodera rostochiensis.
Globodera rostochiensis
                                                                                   Contact: Jones JT
                                                                                                                                                                                                                                                                          AW506070.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              134
jjones@scri.sari.ac.uk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of
                                                                                                                                                                                                                                                                          GI:7143947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the microtiter plate (e.g. MY-06-A-04)."  
199 c    174 g    95 t    35 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 175.2; Pred. No. 1.7e
0; Mismatches
                                         Institute
DD2 5DA, UK
                                                                                                               approach
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      175.2;
No. 1.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .7e-28;
les 230;
                                                                                                                                                                                                                                                                                                                  pcDNAII Globodera rostochiensis
                                                                                                                                                                        Cardle, L.,
                                                                                                                                                                                                                                                                                                       mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                        Phillips, M.S.,
                                                                                                                                                                                                                                                                                                                                   02-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω,.
                                                                                                                                                                                                                  Tylenchina;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    394
                                                                                                                                          potato
                                                                                                                                                                        Helder
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
```

```
ACCESSION
VERSION
                                                                                                                                                                                                            RESULT 1
AI106885
                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BASE CO
                                                                                                                                                                                              LOCUS
                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                Db
                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                          SOURCE
                                                                                                        KEYWORDS
                                                                                                                                                                                  DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FEATURES
                                                                            ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         source
                                                                                                                                                                                                                                                                         637
                                                                                                                                                                                                                                                                                                                                                                                                                                                   457
                                                                                                                                                                                                                                                                                                   565
                                                                                                                                                                                                                                                                                                                                                             505
                                                                                                                                                                                                                                                                                                                                                                                           517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     28
                                                                                                                                                                                                                                                                      ctggcatcggccacgccggtgtccggcaagaccggcatcgcgcaggtggcgac---ggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cagctggtgaagtcggtggccaccaagaccaacgatgttgccggtgacggcaccaccacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gacggcgtcacggtggcacgtgagatcgagctggaagatccgtttgaagacttggggcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcgcgtcgcgccatggaggtcggcatggacaagctggccgacaccgtgcgggtgacgctg 8/
                                                                                                                                                                                                                                                                                                                                                                                           GCCAACGGAGACAAAACCATCGGAAAGCTGATCTCGGACGCGATGAAGAAGGTCGGAAAC
                                                                                                                                                                                                                                                                                                                                                                                                        tcctcgcgcgacgagcagatcggtgacctggttggcgaagcgatgaacaaggtcggccac 504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aacccggtcgcgctcggcgtgggaatcggcaaggccgccgacgcggtattcgaggcgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcaaccatcttggcgcaggcactgatcaagggcggcctgaggctagtggccgccggcgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAGCTTGTGCAGGACGTGGCGAACAAGACCAACGAGGAAGCTGGCGACGGGACAACGTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GATGGTGTCACCGTTGCGAAAGCCATTGACTTCAAGGACAAATTCCAAAACATGGGTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gggccgcgcggcatgtggtgctggccaaggcgtttggcggacccacggttaccaac 1.47
                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAGGCAATGAGCAAAACGGTGACGACGCCTGAGGAAATTGCCCAAGTGGCCACCATCGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GCCACCGTATTGGCGCGTGCTATCGCCAAGGAGGGCTTCGAGAACATTTCCAAAGGTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGACCAAAGGGACGGAATGTGGTAATTGAACAGTCGTGGGGCAGTCCAAAAATCACAAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          330;
fruit fly.
fruit fly.
Drosophila melanogaster
Drosophila melanogaster
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta;
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                AI106885 674 bp mRNA EST GH06135.5prime GH Drosophila melanogaster head melanogaster cDNA clone GH06135 5prime similar FBgn0015245 PID:e254159, mRNA sequence.
                                                                                                         EST
                                                                                                                       AI106885.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Globodera rostochiensis"
/db_xref="taxon:31243"
/clone_lib="Globodera rostochiensis J2 pcDNAII"
/clone_lib="Globodera rostochiensis J2 pcDNAII"
/dev_stage="Second stage juvenile"
/note="Vector: pcDNAII (Invitrogen); Site_1: FcoRI;
Site_2: NotI; mRNA extracted from preparasite J2s of Globodera rostochiensis cloned directionally into pcDNAII plasmid vector."
plasmid vector."
a 153 c 210 g 134 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                       GI:3475820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10.7%;
57.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 173.6; DB 9
Pred. No. 3.9e-28;
0; Mismatches 239
                                                                                                                                                                                                                                                                                                   596
                                                                                                                                                                                                                                                                       668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    239;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                          24-NOV-1998
ad pOT2 Drosophi'
r to X907
                                                                                                                                                                 r2 Drosophila
x99341: Hsp6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               700;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω
-.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  207
                                                                                                                                                                                                                                                                                                                                636
                                                                                                                                                                                                                                                                                                                                                                                           576
                                                                                                                                                                                                                                                                                                                                                                                                                                                   516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1:
```

```
ORIGIN
                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                δδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
 밁
                         δ
                                                            В
                                                                                           δÃ
                                                                                                                               밁
                                                                                                                                                         Qy
                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                              1046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                124
                                                                 484
                                                                                                                               424
                                                                                                                                                                                                                                 869
                                                                                                                                                                                                                                                                                               809
                                                                                                                                                                                                                                                                                                                               244
                                                                                                                                                                                                                                                                                                                                                                                                                                 689
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               509 gcgtggtcagcgtcaaggaatcctccacgctgggcaccgagttggagttcaccgaaggta 568
                                                                                                                                                               929
                                                                                                                                                                                                364
                                                                                                                                                                                                                                                                 304
                                                                                                                                                                                                                                                                                                                                                                                                 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              agatcgacaagagcgattcggattgggatcgggaaaagcttggcgagcggctggccaaac
                                                                                                                                                cggtcgcggtcaaggggccgtacttcggtgaccgccgtaaggcgttccttgaggacctgg
                                                                                                                                                                                                                                                                                                                                                  acgtggagggcgaagcgttggcgacgctggtcgacacgcgattcgcaagacgttgaaag
                                                                                                                                                                                                                                                                                                                                                                                                                  tgttgccattgctggaaaaggttgcaggaacgggtaagccactactgatcgtggctgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                               TGGAGTTCCAAGATGCCCTCCTCCTGCTGTCCGAGAAGAAGATCTCATCGGTGCAGAGCA 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TGAAGTTCGATCGCGGCTACATCTCGCCGTACTTCATCAACTCCTCGAAGGGCGCCAAGG
                                                                                  ttgtcgacggcggcggcaccgcagaagcggtggccaaccggggcgaaccacttgcgtgccg
                                                                                                                               TCAAGGTTAGCGATTTGGGCCAGGTCGGCGAGGTGGTGATCACCAAGGACGACACCCTGC
                                                                                                                                                                                                CCATCGCCTCCGGCGCATTGTCTTCGGCGATGATGCTGATCTCGTCAAGCTGGAGGACG
                                                                                                                                                                                                                                                              TGGCTGCCGTCAAGGCACCCGGCTTCGGCGACAACCGCAAGAGCACCCTCACCGATATGG
                                                                                                                                                                                                                                                                                                                               ATATCGATGGTGAGGCCCTGAGCACCCTGGTGGTGAACCGCCTCAAGATCGGCCTTCAGG
                                                                                                                                                                                                                                                                                                                                                                                                 TCATTCCCGCTCTGGAGCTGGCCAATGCGCAGCGCAAGCCGCTGGTCATCATTGCCGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttggcttccacaaaggcttcttgtcggcatacttcgttaccgacttcgataaccagcagg
AGATCGAGGACACCATCGAGTACGAGAAGGAGAAACTGCAAGAGCGTCTGGCCCGCT
                                                               TGCTGAAGGGCAAGGAAGGACGATGTGCTCCGTCGCCCAATCAGATCAAGGACC
                                                                                                                                                                                                                            cggtggtgacgggtggccacgtggtcaaccccgacgccggcattgtgctgcgcgaggtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 366;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Email: http://www.fruitfly.org/EST, hit genomic sequence DS03308 plate: 61 row: C column: 11 High quality sequence stop: 560. Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   G. M. Rubin-Molecular and Cell Biology
University of Callfornia Berkeley
539 LSA, Berkeley, CA 94720-3200, USA
Fax: 510 643 9947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Contact: Harvey, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ,P., Lewis,S. and Rubin,G.M. BDGP/HHMI Drosophila EST Project Unpublished (1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Harvey, D., Hong, L., Evans-Holm, M., P., Lewis, S. and Rubin, G.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 674)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /clone_lib="GH Drosophila melanogaster head pOT2"
/sex="male and female"
/dev_stage="adult"
/lab_host="DH5 - alpha"
/note="Organ: head; Vector: pOT2; Site_1: EcoRI; Site_2:
XhoI; Sized fractionated cDNAs were directly ligated into
pOT2. plasmid cDNA library."
a 193 c 211 g 124 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone="GH06135"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . 674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 171.8; DB 16;
Pred. No. 9.6e-28;
0; Mismatches 302;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pendleton,J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 est@fruitfly.berkeley.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Su,C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                674;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Brokstein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                              1045
                                                               543
                                                                                                                               483
                                                                                                                                                                                              423
                                                                                                                                                                                                                                                              363
                                                                                                                                                                                                                                                                                               868
                                                                                                                                                                                                                                                                                                                               303
                                                                                                                                                                                                                                                                                                                                                                808
                                                                                                                                                                                                                                                                                                                                                                                               243
                                                                                                                                                                                                                                                                                                                                                                                                                                748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ۲
```

```
REFERENCE
AUTHORS
TITLE
 Q
                                  В
                                                             Qy
                                                                                                  밁
                                                                                                                             δõ
                                                                                                                                                              망
                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
D46006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1166 gcaaggaaagc
|||||||||
862 gacctggcggtggtgacgggtggccacgtggtcaaccccgacgccggcattgtgctgcgc
                                                                802
                                                                                                                                                                 154
                                                                                                                                                                                                                                                             622 cagcaggcggtgctcgaggacgcgttgatcctgctacaccaagacaagatcagctcgctt 681
                                                                                                                                                                                                                                                                                                                            562 gaaggtattggcttccacaaaggcttcttgtcggcatacttcgttaccgacttcgataac 621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             664 AGAAGGATCGC
                                                                                                                                                                                                                                94
                                                                                                                                                                                                                                                                                             34 GAGGGAATGCAGTTTGAACGTGGTTATATCTCCCCGTATTTTGTAACTGACAGCGAGAAA 93
                                                                                                                                                                                                                                                                                                                                                                             Local Similarity
                                                   ttgaaagcggtcgcggtcaaggggccgtacttcggtgaccgccgtaaggcgttccttgag
                                                                                                                                                              AGGGATCTTATCAATGTTTTGGAGGAGGCCATAAGAGGTGCATACCCAATTCTGATAATT
                                                                                                                                                                                                                              ATGTCTGCAGAATATGAGAACTGCAANCTTCTTTTGGTGGACAAAAAAATCACCAACGCA 153
                                  TTGAAAATTGCCGCTATCAAAGCCCCTGGTTTTGGTGAGCGCAAGACCCAGTACTTGGAT
                                                                                                GCTGAGGATATTGAGCAGGAGGCTCTTGCTACTCTTGTTGTCAACAAGCTTAGAGGGTCA
                                                                                                                   gctgaagacgtggagggcgaagcgttggcgacgctggtcgtcaacgcgattcgcaagacg
                                                                                                                                                                                    cccgatctgttgccattgctggaaaaggttgcaggaacgggtaagccactactgatcgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGGCCTCCGGCGTTGCCCCTGCGCGCGTTGGCGGCTCCAGCGAGGTGGAGGTCAACGAGA 663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tggccggcggggttgctgtcatcaaggtgggtgccgccaccgacaccgccactcaaggagc
                                                                                                                                                                                                                                                                                                                                                                360;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Magnollophyta; Liliopsida; Poales; Poaceae; Oryza. 1 (bases 1 to 716) Sasaki,T., Miyao,A. and Yamamoto,K. Rice cDNA from callus 1995 Unpublished (1995) On Mar 9, 1995 this sequence version replaced gi:6997 Contact; Takuji Sasaki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tel: 0298-38-7441
Fax: 0298-38-7468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Oryza sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Oryza sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            D46006.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D46006 716 bp
RICS10372A Rice green
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROJECT ='RGP'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Japan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         National Institute of Agrobiological Rice Genome Research Program
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             D46006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ibaraki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2-1-2 Kannondai, Tsukuba
                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tsasaki@abr.affrc.go.jp
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="Oryza sativa"
/organism="Noryza sativa"
/strain="Nipponbare"
/db_xref="taxon:4530"
/clone_lib="Rice green shoot"
/note="Green shoot (8 days old)"
a 120 c 198 g 175 t 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                               а
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            updated (01-Mar-2000)
Location/Qualifiers
1. .716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GI:7212768
                                                                                                                                                                                                                                                                                                                                                                             10.5%;
                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                              Score 170.4; DE Pred. No. 2e-27; 0; Mismatches 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shoot Oryza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sativa
                                                                                                                                                                                                                                                                                                                                                                                            DB 140;
                                                                                                                                                                                                                                                                                                                                                                317;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Resources
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cDNA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 others
                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gi:699715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           09-MAR-2000
                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                              741
                                333
                                                                861
                                                                                                  273
                                                                                                                                                               213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1165
                                                                                                                                                                                                                                                                                                                                                              0;
```

```
RESULT 1
BE422296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1042
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 922
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gagcgcaaggaaagcgtcgaggatgcggtcggcggccaaggccgcgggtcgaggagggc 1221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  atcgtccctggtggggg 1238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAGGCAGACAAATCAGTTTTAGGAACGGCTGCAAAGGTGGTCCTTAACAAAGAGTCAACA 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATTGTTGTTGGTGGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAGAAGAAGTTGAGAGTTGAGGATGCCCTAAATGCTACCAAGGCTGCTGTTGAGGAAGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAGCTTGCTGGTGGTGCAGTCATTCAGGTGGGAGCACAAACAGAGACCGAACTAAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccgagatcgacaagagcgattcggattcgggatcgggaaaagctttggcgagcggctggcc 1101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gtcattgtcgacggcggcaccgcagaagcggtggccaaccgggcgaaccacttgcgt 1041
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GATATTGCCATTCTAACTGGAGCAACTGTAATCAGGGATGAAGTTGGGCTGTCACTTGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AATCTCATCGAGGCTGCCGAACAAGAATACGAGAAGGAAAAGCTCAATGAGAGGATTGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACAATTGTTGGTGATGGCAGTACACAGGAAGAAGTGACTAAGAGGGTTGCACAAATAAAA 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gaggtgggcttggaggtgctgggcccgacgcgtggtggtcagcaaggacgacacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE422296.1
EST.
                                                                                                                                                                                                                                                                                                                                                                                              Anderson,O.A., Appeis,R., Bailey,P., Blake,T., Close,T., Cloutier,S., Dubcovsky,J., Feuillet,C., Gale,M., Graner,A., Gustafson,P., Herrmann,R.G., Holton,T., Jacquemin,J.M., Jia,J., Joudrier,P., Langridge,P., Lazo,G.R., Lin,J.J., McGuire,P., Ogilhara,Y., Pecchioni,N., Qualset,C., Schuch,W., Selvaraj,G., Shariflou,M., Sorrells,M., Warburton,M. and Wenzel,G.
International Triticeae EST Cooperative (ITEC): Production of Expressed Sequence Tags for Species of the Triticeae Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hordeum vulgare
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; Liliopsida; Poales; Poaceae; Hordeum.
                                                                                                                                                                                                                                      http://wheat.pw.usda.gov/genome
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                        Contact: Wenzel G
TU Munchen, Lehrst
Am Hochanger 2, D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BE422296 1351 bp mRNA E:
HWM022cF.04r ITEC HWM Barley Leaf Library
clone HWM022cF.04, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Magnoliophyta; Liliopsida;
1 (bases 1 to 1351)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE422296
                                                                                                                                                                                                                                                                            Email: wenzel@mm.pbz.agrar.tu-muenchen.de
International Triticeae EST Cooperative (ITEC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  barley.
                                                                                                                                                                                                                                                                                                                   Munchen, Lehrstuhl fur Pflanzenbau und Pflanzenzuchtung
Hochanger 2, D-85350 Freising-Weihenstephan GERMANY
x: 49 08161 71 5173
                                       size.
                                                                          /clone="HWM022cF.04"
/clone_lib="ITEC HWM Barley
/tissue_type="leaf"
/dev_stage="14 day old"
                                                                                                                                                                              /organism="Hordeum vulgare"
/cultivar="Barke"
                                             /note="Vector: pBluescriptSK(~);
size."
                                                                                                                                                            /db_xref="taxon:4513"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GI:9420139
                    281 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           710
                372 g
                    317
                    4
                                                                                                                    Leaf Library"
                    σ
                                                          850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hordeum
                    others
                                                        bp average
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    vulgare
                                                          insert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           393
```

```
AW224051
LOCUS
                                                                                                                                                В
                                                                                                                                                                          20
                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                  Вb
                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                   RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity Matches 393; Conserv
                                                                                                                                                                              1276
                                                                                                                                                                                                                                             1216
                                                                                                                                                                                                                                                                                                             1156
                                                                                                                                                                                                                                                                                                                                                                           1096
                                                                                                                                                                                                                                                                                                                                                                                                                                           1036
                                                                                  840
                                                                                                                                                780
                                                                                                                                                                                                                                                                             660
                                                                                                                                                                                                                                                                                                                                           600
                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 676
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120 GAGAAAATGACCACCGAGTACGAGAACTGCAAGCTGCGTTTGGTTGACAAGAAAATCACC 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   796
                                                                                                                                                                       gaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgtgttctccgaagcc 1335
                                                                                                                                                                                                                                     gagggcatcgtccctggtgggggagcctcgctcatccaccaggcccgcaaggcgctgacc 1275
                                                                                                                                                                                                                                                                                              ctcaaggagcgcaaggaaagcgtcgaggatgcggtcgccgcgcccaaggccgcgggtcgag 1215
                                                                                                                                                                                                                                                                                                                                                          gataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaagacaagatcagc 675
                                                                                CTTGGCTACCCACTCAAGTTGATCGCCAAGAATGCTGGTGTCAATGGC
                                                                                                           cttgccgcgccgttgttctggatcgccgccaacgctggcttggacggc
                                                                                                                                                                                                              CTTAAGGAGAAGATTGCGAGTTGAGGATGCTCTANACGCAACCAAGGCTGCCGTTGAG
                                                                                                                                                                                                                                                                                                                                           ATTGCAAAGCTCGCCGGTGGTGTTGCTGTTATTCAGGTGGGAGCACAAACAGAAACTGAA
                                                                                                                                                                                                                                                                                                                                                                                                                          ttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaagcttggcgagcgg 1095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCGACAACAATAGTTGGTGATGGCAGCACCCAGGAAGAAGTGACTAAGAGGGTTGCACAG 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gacacggtcattgtcgacggcggcgaccgcagaagcggtggccaaccggggggaaccac 1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CTTGACAAGGCAGATAACACAGTTCTAGGAACGGCTGCAAAGGTTGTCCTTACAAAAGAG 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CTGGACGACATTGCCATCCTCACCGGAGGAACTGTTATCAGAGACGAGGTTGGACTCACA 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aagacgttgaaagcggtcgaggtcaaggggccgtacttcggtgaccgccgtaaggcgttc 855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  atcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgtcaacgcgattcgc 795
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggtaagccactactg 735
                                                                                                                                                ATCAAGGACACCCTGGAGAACGACGAGCAGAAGGTCGGAGCTGAGATAGTGAGGAAGGCG
                                                                                                                                                                                                                                                                                                                                                                                                           ATCAAAAATCTCATTGAGGTAGCAGAGCAAGACTACGAGAAGGAAAAACTCAATGAGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggtggtcagcaaggac 975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGTTCTTTGAAAATCTGTGCTATCAAAGCCCCTGGTTTTTGGAGAGCGCAAGACCCAGTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATCATTGCTGAGGATATTGAGCAGGAGGCTCTTGCAACCCTTGTTGTCAACAAGCTAAGA 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AACGCACGGGATCTTATCAATGTTCTGGAGGAAGCCATTAGGGGGTCAATACCCAATCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            51.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pred. No. 5e-2
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 5e-27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                  887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                             719
                                                                                                                                                                                                                                                                                                                                             659
                                                                                                                                                                                                                                                                                                                                                                                                           599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
```

```
REFERENCE
                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                              VERSION
                                           AUTHORS
                                                                                                                                                  ORGANISM
Alcala,J., Vrebalov,J., White,R., Matern,A.L., Holt,I.E., Liang,E Upton,J., Hansen,T., Craven,M.B., Bowman,C.L., Ahn,S., Ronning,C., Fraser,C.M., Martin,G.B., Tanksley,S.D. and Giovannoni,J.
                                                                                                                                                                                                                                                   AW224051 645 bp mRNA EST300862 tomato fruit red ripe, clone cLEN14H9, mRNA sequence.
                                                                             Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spe
Magnoliophyta; eudicotyledons; core eudicots; Asteridae;
[; Solanales; Solanaceae; Solanum; Lycopersicon.
                                                                                                                                                                                           EST
                                                                1 (bases 1 to 645)
                                                                                                                                                  Lycopersicon esculentum
                                                                                                                                                                         tomato
                                                                                                                                                                                                              AW224051.1
                                                                                                                                                                                                                                    AW224051
                                                                                                                                                                                                              GI:6535735
                                                                                                                                                                                                                                                                               TAMU
                                                                                                                                                                                                                                                                        Lycopersicon esculentum
                                                                                                                                                                                                                                                                                              07-DEC-1999
                                                                                                         Spermatophyta;
dae; euasterids
                     Liang, E.,
                                                                                                                                                                                                                                                                               CDNA
```

Query Match

10.4%;

Score

168.6;

DB

108;

Length 1351;

```
Ş
                                     В
                                                                       δÃ
                                                                                                                밁
                                                                                                                                                δã
                                                                                                                                                                                       В
                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
1130 aggtgggtgccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcgg 1189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                        1010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                650
                                                                                                                                                                                           362
                                                                                                                                                                                                                               950
                                                                                                                                                                                                                                                                    302
                                                                                                                                                                                                                                                                                                          890
                                                                                                                                                                                                                                                                                                                                             242
                                                                                                                                                                                                                                                                                                                                                                                                                                                          770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     590 tgtcggcatacttcgttaccgacttcgataaccagccaggcggtgctcgaggacgcgttga
                                                                                                                                                                                                                                                                                                                                                                                                                      182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2 TCTCTCCTTACTTTGTTACCGACAGTGAGAAAATGTCCGTTGAATATGAGAACTGTAAGT
                                                             999atcgggaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatca
                                                                                                                                                                                                                                                                                                                                                               acttcggtgaccgccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacg
                                                                                                                                                                                                                                                                                                                                                                                                                                            cgacgctggtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgt 829
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttgcaggaacgggtaagccactactgatcgtggctgaagacgtggagggcgaagcgttgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tcctgctacaccaagacaagatcagctcgcttcccgatctgttgccattgctggaaaagg
                                       ATGAAAAGGAAAAGCTAAATGAAAGAATTGCTAAGTTATCAGGAGGTGTGGCTGTCATAC
                                                                                                                                      CTGCTAAAGTAGTGCTGACTAAGGATGCCACTACAATTGTTGGTGATGGTAGCACTCAGG
                                                                                                                                                                                                             cccgacgcgtggtggtcagcaaggacgacggtcattgtcgacggcggcggcaccgcag 1009
                                                                                                                                                                                                                                                                                                                                           GTTTTGGTGAGCGAAAAAGCCAGTATCTTGATGACATAGCAACCCTTACTGGAGGCACTG
                                                                                                                                                                                                                                                                                                                                                                                                                    CAACTCTTGTTGTCAATAAGCTTAGAGGTGCCTTGAAGGTCGCTGCACTTAAAGCTCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CTATCAGAAATGGTTACCCCAATTTTAATTATTGCTGAAGATATTGAGCAGGAAGCTTTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TGCTACTGGTTGATAAAAAGATAACAAATGCAAGAGATCTTGTTAATGTCCTGGAAGATG
                                                                                                                AAGCAGTCAACAAACGTGTTGCACAGATTAAAAACCTGATAGAGGCTGCAGATCAAGATT
                                                                                                                                                                                                                                                                    TTATTAGGGAGGAGCTTGGCCTTACCTTGGACAAGGCTGACAAGGAAGTTCTAGGTCATG
                                                                                                                                                                                                                                                                                                  tggtcaaccccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              346;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Generation of ESTs from tomato fruit tissue Unpublished (1999)
Contact: David Frisch
Clemson University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Clemson University
100 Jordan Hall, Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fax:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        prime
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          864 656 4366
864 656 4293
1: dfrisch@CLEMSON.EDU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /tissue_type="pericary"
/dev_stage="red_ripe" (7-20 days post-breaker)"
/note="vector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
/note="vector: pBlueScript SK(-); Site_1: EcoR1; Site_2:
Xho1; supplier: Giovannon1; Fruit were tagged at the
breaker stage (first sign of lycopene accumulation on the
blossom end of the fruit) and harvested 7 days
post-breaker (fully red-ripe), 10 days post breaker, and
20 days post-breaker (over-ripe). 20 day fruit which
showed external or internal signs of pathogenesis were
discarded. Fruit were cut in half and the seeds and
locules were discarded prior to freezing the pericarp."
05 a 102 c 166 g 172 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Lycopersicon
/cultivar="TA496"
/db_xref="taxon:4081"
/clone="cLEN14H9"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /clone_lib="tomato fruit red ripe,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 167.8; DB 87; Length pred. No. 7.2e-27; O; Mismatches 297; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   esculentum'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TAMU'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  645;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                    1069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                       541
                                                                                                                  481
                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                        949
                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                 889
                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     769
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
```

```
δõ
                                                                                                                                              Ωy
                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 1
AI292742
 Ş
                                       밁
                                                                                                              В
                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                          ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                          BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LOCUS
                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 330; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         source
   422
                                       181
                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                        182 aagatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               542
                                                                                                                121
                                                                                                                                                      302
                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                    1 AGGACAAGTTCCAGAACATCGGTGCCAAGCTGGTCCAGGATGTGGCCAACAATACCAACG
                                                                                                                GCTTCGAGAAGATCTCCAAGGGCGCCAATCCCGTCGAGATTCGTCGCGGTGTCATGCTGG
                                                                                                                                                                                       gcatcgcgcaggtggcgacggtgtcctcgcgcgacgagcag---atcggtgacctggttg
                                       CCGTTGAGACCGTCAAGGACAACCTTAAGACCATGTCGCGCCCCGTTAGCACGCCCGAGG
                                                                       ccgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccg
                                                                                                                                                gcctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TCAATGCAACAAAGGCAGCTGTTGAGGAAGGTATTGTTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tcgcggccgccaaggccgcggtcgaggagggcatcgtccctgg 1232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AGGTTGGAGCTCAAACTGAAACTGAATTGAAGGAGAAGAAACTTAGAGTAGAAGATGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AI292742 582 bp mRNA AI397742 582 bp mRNA GH15714.5prime GH Drosophila melanogaster head melanogaster clNA clone GH15714 5prime similar FBgn0015245 PID:e254159, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BDGP/HHMI Drosophila EST Project
Unpublished (1997)
Contact: Harvey, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Email: http://www.fruitfly.org/EST, est@fruitfly.berkeley.edu
hit genomic sequence AC004116; hit genomic sequence AC004721
plate: 157 row: B column: 2
High quality sequence stop: 485.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    University of California Berkeley 539 LSA, Berkeley, CA 94720-3200, Fax: 510 643 9947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Harvey, D., Hong, L., Evans-Holm, M., P., Lewis, S. and Rubin, G.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Muscomorpha; Ephydroidea; Drosophilidae; Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Pterygota; Neoptera; Endopterygota; Diptera; Brachyco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AI292742.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         fruit fly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1 to 582)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M. Rubin-Molecular and Cell Biology
                                                                                                                                                                                                                                                                                                                                                                                                                                                            132
                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /clone_lib="GH Drosophila melanogaster head pOT2"
/sex="male and female"
/sex="male and female"
/dev_stage="adult"
/lab_host="DH5 - alpha"
/lab_host="DH5 - alpha"
/note="Organ: head; Vector: pOT2; Site_1: EcoRI; Site_2:
XhoI; Sized fractionated cDNAs were directly ligated into
pOT2. Plasmid cDNA library."
a 171 c 173 g 106 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone="GH15714"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GI:3942149
                                                                                                                                                                                                                                                                                                                                                           10.4%;
56.7%;
                                                                                                                                                                                                                                                                                                                                             0; Mismatches 249;
                                                                                                                                                                                                                                                                                                                                                             Score 167.6; DB 18; Pred. No. 7.9e-27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pendleton, J., Su, C.,
                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-DEC-1998
pOT2 Drosophila
to X99341: Hsp60
                                                                                                                                                                                                                                                                                                                                                                                   582;
                                                                                                                                                                                                                                                                                                                                           w
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Brokstein
                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                               30]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             601
                                       240
                                                                             421
                                                                                                                180
                                                                                                                                                      361
                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                        24
                                                                                                                                                                                                                                                                                                                                           1;
```

Search completed: January 12, 2001, 18:01:13 Job time: 21209 sec

```
Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OM nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   otal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB seq
Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        d. No. is the number of results predicted by chance to have a re greater than or equal to the score of the result being printed, is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Issued_Patents_NA:*

1: /cgn2_6/ptodata/1,

2: /cgn2_6/ptodata/1,

3: /cgn2_6/ptodata/1,

4: /cgn2_6/ptodata/1,

5: /cgn2_6/ptodata/1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
Match
Minimum Match 0%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 12, 2001, 12:52:12; Search time 153.29 Seconds (without alignments) 1700.021 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IDENTITY_NUC Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        280836 segs, 80580151 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-461-774-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 agcaagctgatcgaatacga.....accacgggcacgcgcactga 1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /cgn2_6/ptodata/1/ina/5A_COMB.seq:*
/cgn2_6/ptodata/1/ina/5B_COMB.seq:*
/cgn2_6/ptodata/1/ina/6_COMB.seq:*
/cgn2_6/ptodata/1/ina/backfiles1.seq:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
1620
2668
2668
16266
16266
16266
11626
11626
11569
11320
11320
11320
11320
11320
11320
11332
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
1133
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
11333
1133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gapext 1.0
             US-08-997-080-161

US-08-997-562-161

US-09-095-855-116

US-08-997-080-116

US-08-997-080-116

US-08-997-562-116

US-08-09-855-116

US-08-470-260-7

US-08-471-491-7

US-08-467-822-28

US-08-467-822-28

US-08-997-080-115

US-08-997-362-115

US-08-997-362-115
                                                                                                                                                                                                                                                                                               US-09-095-855-159
US-08-997-080-113
US-08-997-362-113
US-09-095-855-113
US-09-095-855-113
US-09-031-606-8
US-09-031-606-8
                                                                                                                                                                                                                                                                                                                                                                                         US-09-031-606-10

US-08-461-775-11

US-09-031-606-11

US-08-997-080-159

US-08-997-362-159

US-08-997-362-159

US-09-095-855-159
                                                                                                                                                                                                                                                            US-08-461-775-9
US-09-031-606-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     561672
               Sequence
Sequence
Sequence
Sequence
                                                                                                                                            Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                     Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Description
                                                                                       Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                 Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                             Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                  7, Appli
7, Appli
7, Appli
7, Appli
28, Appl
                                                                                                                                            9, Appli
161, App
161, App
161, App
116, App
116, App
116, App
                                                                                                                                                                                                                                                                            10, Appl
11, Appl
11, Appl
11, Appl
11, Appl
159, App
159, App
113, App
113, App
113, Appl
113, Appl
8, Appl
8, Appl
8, Appl
```

4	4 4	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29
142.4	143	144.6	146.2	147	150.2	151	151.8	156	156	156.6	158.2	158.6	158.6	158.6	158.6	160.6
α α		8.9	9.0	9.1	9.3	9.3	9.4	9.6	9.6	9.7	9.8	9.8	9.8	9.8	9.8	9.9
33/	342	343	343	343	342	343	343	350	350	342	343	360	360	360	360	343
	N	2	N	N	2	N	2	N	_	2	N	ω	ω	N	N	Ν
08-08-99/-080-//	US-08-473-020A-29	US-08-473-020A-8	US-08-473-020A-5	US-08-473-020A-2	US-08-473-020A-31	US-08-473-020A-4	US-08-473-020A-6	US-08-698-948-22	US-08-105-168B-22	US-08-473-020A-28	US-08-473-020A-7	US-09-095-855-79	US-08-873-970-79	US-08-997-362-79	US-08-997-080-79	US-08-473-020A-3
sequence //, Appı	29,	Sequence 8, Appli	5,	Sequence 2, Appli	31,	4,	Sequence 6, Appli	•	Sequence 22, Appl	•	7	Sequence 79, Appl		Sequence 79, Appl	79,	Sequence 3, Appli

ALIGNMENTS

US-08-461-775-10

Sequence 10,

RESULT

```
; NAME/KEY:
; LOCATION:
US-08-461-775-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: PIBM PC COMPUTED
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, VC
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/461,775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                 TELEPHONE: (703) 836-66
TELEFAX: (703) 836-2021
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: MAZODIER, E
APPLICANT: GUGLIEMI, G
TITLE OF INVENTION: RE
TITLE OF INVENTION: IN
                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION DATA:

APPLICATION NUMBER: US 08/050,3

FILING DATE: 10-MAY-1993

APPLICATION NUMBER: FR 9011186

FILING DATE: 10-SEP-1990

ATTORNEY/AGENT IMPORMATION:
                                                                                                     SEQUENCE CHARACTERISTICS:
LENGTH: 1620 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
                                                     MOLECULE TYPE: FEATURE:
                                                                                                                                                                                                                                      TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                             NAME: Crane-Feury, Sharon E
REGISTRATION NUMBER: 36,113
REFERENCE/DOCKET NUMBER: 01(
                                                                                         TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                             FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET: George Ma
CITY: Alexandria
STATE: Virginia
                                                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0, Application US/08461775
5858773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RY: United States 22313-1404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  George Mason Bldg.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MAZODIER, Philippe
                                    CDS
                                                                                         linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Burns, Doane,
                                                                      DNA (genomic)
                                                                                                                                                                                                                       836-6620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REGULATORY NUCLEOTIDE SEQUENCE INITIATION OF TRANSCRIPTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gerard
                                                                                                                                                                                                                                                                                                                                                                                     US 08/050,313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US/08/461,775
                                                                                                                                                                                     10:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Swecker & Mathis
                                                                                                                                                                                                                                                           010830-035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Washington & Prince
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               읁
```

```
γQ
                                                                                                                                                                                                                                                                                                                               Д
                          B
                                            δÃ
                                                                           망
                                                                                                  γ
                                                                                                                             B
                                                                                                                                                 Qy
                                                                                                                                                                            Вþ
                                                                                                                                                                                                δð
                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches 1086;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
  1018
                                                                             907
                                                                                                                             847
                                                  958
                                                                                                                                                      838
                                                                                                                                                                                                                                                                               667
                                                                                                                                                                                                                                                                                                        664
                                                                                                                                                                                                                                                                                                                               607
                                                                                                                                                                                                                                                                                                                                                                                547
                                                                                                                                                                                                                                                                                                                                                                                                                                 487
                                                                                                                                                                               787
                                                                                                                                                                                                                                                                                                                                                      604
                                                                                                                                                                                                                                                                                                                                                                                                        544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        424
                                                                                                                                                                                                                              727
                                                                                                                                                                                                                                                       724
                                                                                                                                                                                                                                                                                                                                                                                                                                                        484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aagctgatcgaatacgacgaaaccgcgcgtcgcgcatggaaggtcggcatggacaagctg
                                                                                                                                           gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                             gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                                                                                                                                                                                                                                             accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                       gtggtggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                          cccgacgccggcattgtgctgcgcgaggttgggcttggaggtgctgggctcggcccgacgc
                                                                                                                                                                                                                                                                                                                                                                               GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCGTACATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa 483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                          gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt
                                                                                                                                                                                                                                                                               GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                              gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc 543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gatccgtttgaagacttgggcgcccagctggtggagtcggtggccaccaagaccaacgat 243
gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgg
                          GTCACCGTCACCAAGGACGACGACCATCGTGGACGGCGGCGGCAACGCCGAGGACGTC
                                                                                                                                                                               GTGGTCAACAAGATCCGCGGCACGTTCAACGCCGTCGCCGTCAAGGCGCCCCGGCTTCGGT
                                                                                                                                                                                                                               GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG
                                                                                                                                                                                                                                             GCGATGGACAAGGTCGGCAAGGACGGTGTCATCACCGTCGAGGAGTCCAACACCTTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATCGCCGCCGTCGCCGCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTCGCCGCCGTCTCCGCCGAGCTGCTCGACACCGCGCGCCCGATCGACGACAAGTCCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CTGCGCAACGTCGCCGGCGGCGCCTCCCCGGCCGCCCTGAAGAAGGGCATCGACGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATCGCGGGTGACGGCACCACCACCGCGACCGTGCTGGCCCAGGCGCTGGTCCGCGAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTCGGCGCCCCGACCATCACCAACGACGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCCGACACCGTCAAGGTGACCATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccgacaccgtgcgggtgacgctggggccgcgggcatgtggtgctggccaaggcg 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAGATTCTGAAGTTCGACGAGGACGCCCCGTCGCGCCCTTGAGCGCGCGTGAACCAGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  45.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 741.6; DB 2;
Pred. No. 1.1e-147;
0; Mismatches 504;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
  1077
                                                                           966
                                                                                                    957
                                                                                                                             906
                                                                                                                                                                             846
                                                                                                                                                                                                     837
                                                                                                                                                                                                                                                       777
                                                                                                                                                                                                                                                                               726
                                                                                                                                                                                                                                                                                                                               666
                                                                                                                                                                                                                                                                                                                                                      663
                                                                                                                                                                                                                                                                                                                                                                                                      603
                                                                                                                                                                                                                                                                                                                                                                                                                                 546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ωy
                                                                                                                                                                                                                                                                                                                                                                                         US-09-031-606-10
                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                 Sequence 10, Patent No. 6
                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/
FILING DATE: 10-MAY-1993
APPLICATION NUMBER: FR 901
FILING DATE: 10-SEP-1990
ATTORNEY/AGENT INFORMATION:
NAME: Crane-Feury, Sharon
                                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                             SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/031,60
                                                                                                                                                                                                                                                                                         TITLE OF INVENTION:
TITLE OF INVENTION:
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1147
                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                             APPLICANT: MAZODIER, APPLICANT: GUGLIEMI,
                                                                                                                                                                                                                                                                                                                                                                                                                                            1561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1027
                                                                                                                                                                                                              STREET: George Mas
CITY: Alexandria
STATE: Virginia
COUNTRY: United St
                                                                                      CLASSIFICATION:
                                                                                                    FILING DATE:
                                                                                                                                                                                                                                                                 ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                   0, Application 6153404
                                                                                                                                                                                                     22313-1404
                                                                                                                                                                                                                                                     E: Burns, Doa
George Mason
                                                                                                                                                                                                                   United States
                                                                                                                                                                                                                                                                                         R, Philippe
I, Gerard
REGULATORY
INITIATION
: 15
                                                                                                                                                                                                                                                                  Doane,
                                                                                                                                                                                                                                                                                                                                                                               US/09031606
                                     FR 9011186
                                                                                                                                                                                                                                                    Bldg.,
                                                             08/050,313
                                                                                                                                                                                                                                                    Swecker & Mathis
y., Washington &
 H
                                                                                                                                                                                                                                                                                                      NUCLEOTIDE SEQUENCE OF TRANSCRIPTION
```

Version

#1

Prince

of F

aacaccctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgact GCGTCCGCCCTGGAGAACGCGGCCTCCATCGCCTCCCTGCTCCTGACGACCGAGACCCTG gtggtcgacaagccggccaaggcagaagatcacgaccatcac aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc GAGGGCTACGTCATCACCACCAAGGTGGCGGAGCTCGACAAGGGCCCAGGGCTTCAACGCG gacggctcggtggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtg GCGGTCGTCCGCCGCCGCCGTCGAGCCGCTGCGCTGGATCGCCGAGAACGCCGGCCTC gacgtgttctccgaagcccttgccgcgccgttgttcttggatcgccgccaacgctggcttg GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGGCGTCTGCGTGATCCGCGTCGGC 1146 GTCGTCGAGAAGCCGGCCGAGGAGGAGGCCCGAGGCCGGTCAC GCCGTCAAGGTCCTGGACGACAACCTCGGC----CGCACCGGCGACGAGGCCACCGGTGTC gcccgcaaggcgctgaccgaactgcgttgcgtcgctgaccggtgaccgaggtcctcggtgtc gccaaggccgcggtcgaggagggcatcgtccctggtggggggagcctcgctcatccaccag GCGGCCACCGAGGTCGAGCTGAAGGAGCGCCAAGCACCGTCTGGAGGACGCCATCTCCGCG gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc 1197 gaaaagcttggcgagctggccaaactggccggcggggttgctgtcatcaaggtgggt 1137 ACCCGCGCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC---1602 1599 1437 1500 1440 1320 1317 1263 1206 1086 1560 1380

```
Ş
                                             밁
                                                                VΩ
                                                                                            밁
                                                                                                              δÃ
                                                                                                                                           B
                                                                                                                                                               QΥ
                                                                                                                                                                                      뫄
                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
밁
                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-031-606-10
                                                                                                                                                                                                                                                                                       ٥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 1086;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REGISTRATION NUMBER: 36,113
REFERENCE/DOCKET NUMBER: 010
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 836-6620
TELEPHONE: (703) 836-2021
INFORMATION FOR SEQ ID NO: 10:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MOLECULE TYPE: FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE CHARACTERISTICS:
LENGTH: 1620 base pair
                       724
                                                                                               607
                                                                                                                     604
                                                                                                                                            547
                                                                                                                                                                    544
                                                                                                                                                                                            487
                                                                                                                                                                                                                    484
                                                                                                                                                                                                                                              427
                                                                                                                                                                                                                                                                     424
                                                                                                                                                                                                                                                                                            367
                                                                                                                                                                                                                                                                                                                     364
                                                                                                                                                                                                                                                                                                                                             307
                                                                                                                                                                                                                                                                                                                                                                                              247
                                                                                                                                                                                                                                                                                                                                                                                                                    244
                                                                                                                                                                                                                                                                                                                                                                                                                                               187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               127
727
                                                                                                                                                                                                                                                                                                                                                                      304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE: nucleic acid
STRANDEDNESS: double
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4 aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                                                                                                                                                                                                                                           gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                         gttaccgacttcgataaccagcaggcggttgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                       accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                          | gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc
                                                                                                                                                                                                                                                        atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                          ctgaggctagtggccgccggcgtcaaccccggtcgcgctcggcgtgggaatcggccaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAGATTCTGAAGTTCGACGAGGACGCCCGTCGCGCCCTTGAGCGCGCGTGAACCAGCTG
GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG
                                             GCCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT
                                                                                            GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG
                                                                                                                                             GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCGTACATG
                                                                                                                                                                                             GCGATGGACAAGGTCGGCAAGGACGGTGTCATCACCGTCGAGGAGTCCAACACCTTCGGT
                                                                                                                                                                                                                                           ATCGCCGCCGTCGCCGCGCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG
                                                                                                                                                                                                                                                                                                                                            CTGCGCAACGTCGCCGCCGCGCCTCCCCGGCCGCCCTGAAGAAGGGCATCGACGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCCGACACCGTCAAGGTGACCATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1620 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              45.9%;
nilarity 67.8%;
Conservative
           aagccactactgatcgtggctgaagacgtggagggcgaagcgtttggcgacgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
1..1620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 741.6; DB 3;
Pred. No. 1.1e-147;
0; Mismatches 504;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       010830-035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12;
                                             726
                                                                                              666
                                                                                                                     663
                                                                                                                                            606
                                                                                                                                                                                            546
                                                                                                                                                                                                                   543
                                                                                                                                                                                                                                            486
                                                                                                                                                                                                                                                                                            426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      63
                                                                                                                                                                                                                                                                                                                                             366
                                                                                                                                                                                                                                                                                                                                                                    363
                                                                                                                                                                                                                                                                                                                                                                                              306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ψ
```

US-08-461-775-11

Sequence 11, Application Patent No. 5858773
GENERAL INFORMATION:

us/08461775

APPLICANT: MAZODIER, Philippe APPLICANT: GUGLIEMI, TITLE OF INVENTION: REGULATORY TITLE OF INVENTION: INITIATION

NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:

INITIATION
15

NUCLEOTIDE SEQUENCE OF TRANSCRIPTION

Swecker & Mathis Washington

& Prince

Sts.

ADDRESSEE: Burns, Doane, Swe STREET: George Mason Bldg., CITY: Alexandria STATE: Virginia

```
δÃ
                                                                                      Вр
                                                                                                           γ
                                                                                                                                                     Qy
                                                                                                                                                                              В
                                                                                                                                                                                                 οy
                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                     Ъ
                 δÃ
                                           В
                                                                                                                                  В
                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                Db.
                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                            рь
                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                        Д
                                                                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                    1318
                                                                                                                                                                                                                           1264
                                                                                                                                                                                                                                                                                                                                                             1087
                                                                                                                                                                                                                                                                                                                                                                                                         1027
                                                                                                                                                                                                                                                                                                                                                                                   1078
                                                                                                                                                                                                                                                                                                                                                                                                                              1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                      967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  907
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             778
GTCGTCGAGAAGCCGGCCGAGGAGGAGGAGCCCGAGGCCGGTCAC
                                                                                                                                                                                                                                                                   gccaaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccag
                                                                                                                                                                                                                                                                                                                aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc
                                                                                                 aacaccctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgact
                                                                                                                                               gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                                                                                                                                                                    gcccgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt
                   gtggtcgacaagccggccaaggcagaagatcacgaccatcac 1599
                                         GCGTCCGCCCTGGAGAACGCGGCCTCCATCGCCTCCCTGCTCCTGACGACCCGAGACCCTG
                                                                                       GCCACCGGCGAGTACGGCGACCTGGTCAAGGCCGGCGTCATCGACCCGGTCAAGGTCACC
                                                                                                                                  GAGGGCTACGTCATCACCACCAAGGTGGCGGAGCTCGACAAGGGCCAGGGCTTCAACGCG
                                                                                                                                                                              GCGGTCGTCGCCGCCGCCGTCGAGCCGCTGCGCTGGATCGCCGAGAACGCCGGCCTC
                                                                                                                                                                                                                         GCCGTCAAGGTCCTGGACGACAACCTCGGC----CGCACCGGCGACGAGGCCACCGGTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctcggctcggccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTGGTCAACAAGATCCGCGGCACGTTCAACGCCGTCGCCGTCAAGGCGCCCCGCCTTCGGT
1602
                                                                                                             1497
                                                                                                                                 1440
                                                                                                                                                                              1380
                                                                                                                                                                                                                        1320
                                                                                                                                                                                                                                                                      1263
                                                                                                                                                                                                                                                                                          1257
                                                                                                                                                                                                                                                                                                                                      1197
                                                                                                                                                                                                                                                                                                                                                                                  1137
                                                                                                                                                                                                                                                                                                                                                                                                                              1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1017
                                                                                                                                                        1437
                                                                                                                                                                                                                                                                                                                 1206
                                                                                                                                                                                                                                                                                                                                                                                                         1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                      1026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            906
```

States

```
δõ
                                                    B
                                                                            Q
                                                                                                               밁
                                                                                                                                    Qy
                                                                                                                                                                       В
                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/DOCKET NUMBER: 010830-035
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 836-6620
TELEPAX: (703) 836-2021
INFORMATION FOR SEQ ID NO: 11:
SEQUENCE CHARACTERISTICS:
LENGTH: 2668 base pairs
TYPE: nucleic acid
STRANDENNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 1092; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/050,31
FILING DATE: 10-MAY-1993
APPLICATION NUMBER: FR 9011186
FILING DATE: 10-SEP-1990
ATTORNEY/AGENT INFORMATION:
NAME: Crane-Feury, Sharon E
REGISTRATION NUMBER: 36,113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                                                       1275
                                                                                                                                                                          1155
                                                                                                                                                                                                                                   1095
                                                                                                                                                                                                                                                                                            1035
                                                                                                                1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE: DNA (genomic) -461-775-11
                                                                                    424
                         484
                                                                                                                                           364
                                                                                                                                                                                                      304
                                                                                                                                                                                                                                                            244
                                                                                                                                                                                                                                                                                                                      184
                                                                                                                                                                                                                                                                                                                                                  975
                                                                                                                                                                                                                                                                                                                                                                             124
                                                                                                                                                                                                                                                                                                                                                                                                           915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   855
                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4
                                                                                                            gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc 423
                                                   aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
             gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc 543
                                                                                                                                                                                                                                               gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc 303
GCGATGGACAAGGTCGGCAAGGACGGTGTCATCAACGTCGAGGAGTCCAACACCTTCGGT
                                                                                                                                                                                                                                   ATCGCGGGTGACGGCACCACCGCGACCGTGCTGGCCCAGGCGCTGGTCCGCGAGGGC
                                                                                                                                                                                                                                                                                          GACCCGTACGAGAACCTCGGCGCCCAGCTCGTCAAGGAGGTGGCGACCAAGACCAACGAC
                                                                                                                                                                                                                                                                                                       gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccccccaagacccaacgat 243
                                                                                                                                                                                                                                                                                                                                                 TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
                                                                                                                                                                                                                                                                                                                                                                 tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa 183
                                                                                                                                                                                                                                                                                                                                                                                                          GCCGACACCGTCAAGGTGACCATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                          9ccgacaccgtgcgggtgacgctgggggccgcgcgggcatgtggtggtggccaaggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAGATTCTGAAGTTCGACGAGGACGCCCCTCGCGCGCCCTTGAGCGCGGCGTGAACCAGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RY: United
22313-1404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        45.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          36,113
ER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US/08/461,775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08/050,313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 727.4; DB 2;
Pred. No. 1.1e-144;
0; Mismatches 516;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                               1274
                                                                                                                                                                          1214
                                                                                                                                                                                                   363
                                                                                                                                                                                                                                                                                         1094
                                                                                                                                                                                                                                                                                                                                                  1034
                                                                                                                                                                                                                                                                                                                                                                                                          974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4.
```

..

```
Qy
                                                      Ş
                                                                                                               Qγ
                                                                                                                                                                    Qy
                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вр
                             В
                                                                                   B
                                                                                                                                           Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                           2409
                                                                                                                                                                                                                                                                                                                  2112
                                                       1558
                                                                                                                 1498
                                                                                                                                             2289
                                                                                                                                                                       1438
                                                                                                                                                                                                                               1378
                                                                                                                                                                                                                                                           2169
                                                                                                                                                                                                                                                                                      1318
                                                                                                                                                                                                                                                                                                                                               1258
                                                                                                                                                                                                                                                                                                                                                                          2055
                                                                                                                                                                                                                                                                                                                                                                                                                                  1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                            1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1635
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           724
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   664
                                                                                                                                                          aacaccctgagctatggtgacttggccgcttgacggtcatcgacccggtcaaggtgact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGGCGTCTGCGTGATCCGCGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccaaccgggcgaaccacttgcgtgccgagatcgaccaagagcgattcggattcggattcgg 1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG
tga 1617
                                             gtggtcgacaagccggccaaggcagaagatcacgaccatcac---cacgggcacgcgcgcac
                                                                                                                                                                                                                  GCGGTCGTCCGCCGCCGCCGTCGAGCCGCTGCGCTGGATCGCCGAGAACGCCGGCCTC
                                                                                                                                                                                                                                                                         gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                                                                                                                                                                                                                                                   GCCGTCAAGGTCCTGGACGACAACCTCG----GCCGCACCGGCGACGAGGCCACCGGTGTC
                                                                                                                                                                                                                                                                                                                                  gcccgcaaggcgctgaccgaactgcgttgcgtcgctgaccggttgaccgaggtcctcggtgtc
                                                                                                                                                                                                                                                                                                                                                                                      gccaaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccag
                                                                                                                                                                                                                                                                                                                                                                                                                                              gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gaaaagcttggcgagctggccaaactggccggcggggttgctgtcatcaaggtgggt 1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtggtggtcagcaaggacgacacggtcattgtcgacggcggcggcggcaccgcagaagcggtg 1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cccgacgccggcattgtgctgcgcgaggttgggcttggaggtgctgggctcggccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt 723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gttaccgacttcgataaccagcaggcggttgctcgaggacgcgttgatcctgctacaccaa
                             GTCGTCGAGAAGCCGGCCGAGGAGGAGGCCGAGGCCGGTCACGGTCACGGGCACAGCCAC
                                                                                     CGCTCCGCCCTGGAGAACGCGGCCTCCATCGCCTCCCTGCTCCTGACGACCGAGACCCTG
                                                                                                                                             GCCACCGGCGAGTACGGCGACCTGGTCAAGGCCGGCGTCATCGACCCGGTCAAGGTCACC
                                                                                                                                                                                                     GAGGGCTACGTCATCACCAACCAAGGTGGCGGAGCTCGACAAGGGCCAGGGCTTCAACGCG
                                                                                                                                                                                                                                                                                                                                                                          ACCCGCGCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC---
                                                                                                                                                                                                                                                                                                                                                                                                                                GCGGCCACCGAGGTCGAGCTGAAGGAGCGCCAAGCACCGTCTGGAGGACGCCATCTCCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTCACCGTCACCAAGGACGACACGACCATCGTGGACCTGGAGAAGGACGCCGAGGACGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG
                                                                                                                                                                      1497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15,74
                                                          1614
                                                                                                                                                                                                                               1437
                                                                                                                                                                                                                                                           2228
                                                                                                                                                                                                                                                                                                                   2168
                                                                                                                                                                                                                                                                                                                                                                                                                                                            1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1514
                                                                                                                                                                                                                                                                                                                                                                          2111
                                                                                                                                                                                                                                                                                                                                                                                                                                  2054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        957
```

δÃ

```
Š
                                                                       DЪ
                                                                                           QY
                                                                                                                    망
                                                                                                                                         Ş
 QΥ
                        밁
                                                                                                                                                                   В
                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-031-606-11
                                                                                                                                                                                                               Query Match 45.0%;
Best Local Similarity 67.3%;
Matches 1092; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Patent No. 6153404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 11,
                                                                                                                                                                                                                                                                          STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: DNA (gen-
09-031-606-11
                                                                                                                                                                                                                                                                                                                                             TELEFAX: (703) 836-2021
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE/DOCKET NUMBER: 36,113
REFERENCE/DOCKET NUMBER: 010830-035
RELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE: 10-SEP-1990
ATTORNEY/AGENT INFORMATION:
NAME: Crane-Feury, Sharon E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0
                         1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 0:
FILING DATE: 10-MAY-1993
APPLICATION NUMBER: FR 9:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: MAZODIER, APPLICANT: GUGLIEMI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE OF INVENTION:
                                                                                                                                                                     855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: George Mas
CITY: Alexandria
STATE: Virginia
COUNTRY: United St
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
                                                184
                                                                                                                      915
                                                                                                124
                                                                                                                                           64
                                                                                                                                                                                                                                                                                                                       TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE: CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                 TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                   LENGTH:
                                                                                                                                                                            4 aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE:
                                                                                                                                gccgacaccgtgcgggtgacgctggggccgcggccggcatgtggtgctggccaaggcg
gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                     gatccgtttgaagacttgggcgccagctggtgaagtcggtggccaccaagaccaacgat
                                                                                  tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                                                                                                                                                                   GACCCGTACGAGAACCTCGGCGCCCAGCTCGTCAAGGAGGTGGCGACCAAGACCAACGAC
                                                                                                                     GCCGACACCGTCAAGGTGACCATCGGCCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                       TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGA —
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RY: United States 22313-1404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2471
                                                                                                                                                                                                                                                                                                                                   2668 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Application US/09031606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    George Mason Bldg.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Burns, Doane,
                                                                                                                                                                                                                                                                                                                                                                                  (703) 836-6620
                                                                                                                                                                                                                                                                                     DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REGULATORY NUCLEOTIDE SEQUENCE OF INITIATION OF TRANSCRIPTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Philippe
Gerard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       us/09/031,606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9011186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          08/050,313
                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Swecker & Mathis
j., Washington &
                                                                                                                                                                                                               Score 727.4; DB 3;
Pred. No. 1.1e-144;
0; Mismatches 516;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     & Prince
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               #
                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sts
                                                                                                                                                                                                                15;
                                                                                                                                                                                                              Gaps
                        1094
                                                                       1034
                                                                                             183
                                                                                                                    974
                                                                                                                                           123
                                                                                                                                                                   914
                                                                                                                                                                                       63
                                                                                                                                                                                                                4
           Ş
                                  В
                                                      δõ
                                                                                 Ъ
                                                                                                    δÃ
                                                                                                                             В
                                                                                                                                                  δÃ
                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뭥
            1318
                                   2112
                                                                                                                                                                            1935
                                                                                                                                                                                                    1078
                                                                                                                                                                                                                           1875
                                                                                                                                                                                                                                                  1018
                                                                                                                                                                                                                                                                         1815
                                                                                                                                                                                                                                                                                                                                                                                                                     1635
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1455
                                                                                                                                                                                                                                                                                                                                                                      1695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            364
```

```
gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                             gcccgcaaggcgctgaccgaactgcgtgcgttgaccggtgacgaggtcctcggtgtc
                                                                                                                                                                                      gccaaggccgcggtcgaggagggcatcgtccctggtggggggagcctcgctcatccaccag
                                                                                                                                                                                                                                                                             gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc
                                                                                                                                                                                                                                                                                                                                                                      gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggtgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gtggtggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctcgggctcggccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gaccgccgtaaggcgttccttgaggacctggcggtggtggcgggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gcgatgaacaaggtcggccacgacagcgttggtcaagcgtcaaggaatcctccacgctgggc
                                                                        GCCGTCAAGGTCCTGGACGACAACCTCG
                                                                                                                                                               ACCCGCGCCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC---
                                                                                                                                                                                                                                                                                                                                            GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGGCGTCTGCGTGATCCGCGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                  GTCACCGTCACCAAGGACGACGACGACCATCGTGGACCTGGAGAAGGACGCCGAGGACGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAGGAGGTCGGCCTCAAGCTCGACCAGGCCGGTCTGGACGTGCTGGGCACCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTGGTCAACAAGATCCGCGGCACGTTCAACGCCGTCGCCGTCAAGGCGCCCCGGCTTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCGGCCACCGAGGTCGAGCTGAAGGAGCGCCAAGCACCGTCTGGAGGACGCCATCTCCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----aagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGATGGACAAGGTCGGCAAGGACGGTGTCATCAACGTCGAGGAGTCCAACACCTTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATCGCCGCCGTCGCCGCGCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CTGCGCAACGTCGCCGGCGCGCCTCCCCGGCCGCCCTGAAGAAGGGCATCGACGCCGCC
                                                                        2168
                                                                                                                                                                 2111
                                                                                                                                                                                                                                                                                                  1197
                                                                                                                                                                                                                                                                                                                                            1994
                                                                                                                                                                                                                                                                                                                                                                                        1137
                                                                                                                                                                                                                                                                                                                                                                                                                                     1934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        363
```

65

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                            US-08-997-080-159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-997-080-159
                                           Query Match 42.4
Best Local Similarity 65.6
Matches 1035; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Patent No. 5968524 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 159, Application US/08997080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CIASON DOS THE COLOR OF THE COL
                                                                                                                                                                                                                                                                  INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                 ATTORNEY/AGENT INFORMATION:
NAME: Sleath, Janet
REGISTRATION NUMBER: 37,007
                                                                                                                                                                                                                                                                                                                                                        REFERENCE/DOCKET NUMBER: 11
TELECOMMUNICATION INFORMATION:
TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CLASSIFICATION: PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
.MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: METHODS NUMBER OF SEQUENCES: 194
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: WATSON, JAMES APPLICANT: TAN, PAUL L.J.
                                                                                                                                                                            TYPE: nucleic acid
STRANDEDNESS: sing
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: 2601 F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: FILING DATE:
                                                                                                                                                                                                                                                                                                                  TELEX:
                                                                                                                                                                                                                                                                                                                                      TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                              LENGTH:
      ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc
  caagctgatcgaatacgacgaaaccgcgcgtcgccatggaggtcggcatggacaagct 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTCGTCGAGAAGCCGGCGAGGAGGAGCCCGAGGCCGGTCACGGTCACGGGCACAGCCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aacaccctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgact 1497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gtggtcgacaagccggccaaggcagaagatcacgaccatcac---cacgggcacgcgcac 1614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGCTCCGCCCTGGAGAACGCGGCCTCCATCGCCTCCTGCTCCTGACGACCGAGACCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GAGGGCTACGTCATCACCACCAAGGTGGCGGAGCTCGACAAGGGCCAGGGCTTCAACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCCACCGGCGAGTACGGCGACCTGGTCAAGGCCGGCGTCATCGACCCGGTCAAGGTCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCGGTCGTCCGCCGCCGCCGTCGAGCCGCTGCGCTGGATCGCCGAGAACGCCGGCCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₩Ã
                                                                                                                                                                                                                                         1626 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2601 Elliott Avenue,
                                                                                                                                                                                                                                                                                                                                      206-269-0563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Law Offices of Ann
                                                                                                                                                                                                   single
                                                                    42.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    us/08/997,080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .
                                             Score 685.6; DB 2;
Pred. No. 6.3e-136;
0; Mismatches 534;
                                                                                                                                                                                                                                                                                                                                                                                                      11000.1007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AND COMPOUNDS FOR THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Suite 4185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Σ
                                                 Indels
                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TREATMENT
                                               9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OF.
                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IMMUNOLOGICALLY-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2228
                                             2
                        Š
                                                                                                        Qy
                                                                                                                                                       밁
                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                        ρ
                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
                        1083
                                                                    1026
                                                                                                            1023
                                                                                                                                                       966
                                                                                                                                                                                                   963
                                                                                                                                                                                                                                              906
                                                                                                                                                                                                                                                                                      903
                                                                                                                                                                                                                                                                                                                                    846
                                                                                                                                                                                                                                                                                                                                                                               843
                                                                                                                                                                                                                                                                                                                                                                                                                        786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      663 agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg 722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
                                                                                                                                                                                                                                                                                                                                                                                                                     ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggttggccaa
                                                                                                                                                                                                                                                                                                                                    CCGCAAGGCGATGCTGCAGGACATGGCCATCCTCACCGGTGGTCAGGTCGTCAGCGAAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCCACGCTGGTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt 782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CTCCAAGGTGTCGACCGTCAAGGATCTGCTCCCGCTGCTGGAGAAGGTCATCCAGGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGCCATGGACAAGGTCGGCAACGAGGGTGTCATCACCGTCGAGGAGTCGAACACCTTCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga 242
                                                                                                                                                       CGTCACCAAGGACGAGACCACCATCGTCGAGGGCTCGGGGCGATTCCGATGCCATCGCCGG
                                                                                                                                                                                                                                              AGTCGGGCTGTCCCTGGAGACCGCCGACGTCTCGCTGCTGGGCCCAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                       cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                           agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GATTTCTGCCACCGCGGCGATTTCCGCCGGCGACACCCCAGATCGGCGAGCTCATCGCCGA 485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggccgacaccgtgcgggtgacgctggggccgcgggcatgtggttgctggccaaggc 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CAAGACAATTGCGTATGACGAAGAGGCCCGCGTGGCCTCGAGCGGGGCCTCAACGCCCT
                                                                    CCGGGTGGCTCAGATCCGCGCCGAGATCGAGAACAGCGACTCCGACTACGACCGCGAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGTGACCGACGCCGAGCGCCAGGAAGCCGTCCTGGAGGATCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CCTGCAGCTCGAGCTCACCGAGGGTATGCGCTTCGACAAGGGCTACATCTCGGGTTACTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCTGCGCAACGTCGCCAGCCGGCGCCAACCCGCTCGGCCTCAAGCGTGGCATCGAGAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cctgaggctagtggccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgttgccggtgacggcaccaccgccaccgccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGACCCGTACGAGAAGATCGGCGCTGAGCTGGTCAAAGAGGTCGCCAAGAAGACCGACGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGCAGACGCCGTAAAGGTGACGTTGGGCCCGAAGGGTCGCAACGTCGTGCTGGAGAAGAA 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTGGGGCCCCCCACGATCACCAACGATGGTGTCCCATCGCCAAGGAGATCGAGCTGGA 185
                                                                                                                                                          1025
                                                                                                                                                                                                                                              965
                                                                                                                                                                                                                                                                                                                                    905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      542
                                                                                                                                                                                                                                                                                                                                                                                                                        845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
```

785

725

365

305

Qy В Ş 밁 δδ

В Ωy B Qy 밁

Qγ

日

Q 밁 δÃ

망

2

```
RESULT 6
US-08-997-362-159
APPLICATION NUMBER: US/08/997,362

FILING DATE:
CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: U.S. Patent Application No
FILING DATE: June 12, 1997
APPLICATION NUMBER: U.S. Patent Application No
FILING DATE: August 29, 1996
ATTORNEY/AGENT INFORMATION:
NAME: Sleath, Janet
REGISTRATION NUMBER: 37,007
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 159,
Patent No. 591
                                                                                                                                                                                                                                                                                                                     APPLICANT: Skinner, Margot
APPLICANT: Scott, Linda
APPLICANT: Prestidge, Ross
TITLE OF INVENTION: COMPOUNDS A
TITLE OF INVENTION: TREATMENT A
NUMBER OF SEQUENCES: 194
                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
APPLICANT: Tan, P
                                                                                                                                                SOFTWARE: FastSEQ for Windows Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1266
                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
ADDRESSEE: Law Offices of Ann
                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1263
                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1146
                                                                                                                                                                                                                                                                  STREET: 2601 F
                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                               ADDRESSEE: Law Offices of An STREET: 2601 Elliott Avenue,
                                                                                                                                                                           OPERATING SYSTEM:
                                                                                                                                                                                      COMPUTER:
                                                                                                                                                                                                                                                       STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgacaagccggccaaggc 1580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 T---GCGCTGGACGACCTCGGC-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGTCCGCGTGGCGCTCGGCTCCGCTCAAGCAGATCGCCTTCAACGGCGGCCTGGAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gttctccgaagcccttgccgcgcgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGACAAGCCGGAGAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGCGCTGCAGAACGCGGCGTCCATCGCGGCTCTGTTCCTCACCACCGAGGCCGTCGTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGGTGAGTACGAGGACCTGCTCAAGGCCGGCGTCGACCCGGTGAAGGTCACCCGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGGCGTCGTTGCCGAGAAGGTGTCCAACCTGCCCGCGGGTCACGGCCTCAACGCCGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CACCGAGGTGGAGCTCAAGGAGCGCCAAGCACCGCATCGAGGACGCCGTCCGCAACGCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCTGCAGGAGCGCCTGGCCAAGCTGGCCGGCGGTGTTGCGGTGATCAAGGCCGGAGCTGC 1145
                                                                                                                                                                                                                               98121
                                                                                                                                                                                                                                                                                                                                                                                                                                                      59, Application US/08997362
5985287
                                                                                                                                                                                                                                                       WA
                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                  Visser, Elizabeth
                                                                                                                                                                                                                                                                                                                                                                                                             Hiyama, Jun
                                                                                                                                                                                     IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                              Paul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1574
                                                                                                                                                                                                                                                                                                                                  AND
                                                                                                                                                                                                                                                                                n W. Speckman
Suite 4185
                                                                                                                                                                                                                                                                                         Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -CTGACGGGCGACGAGGCCACCGGTGCCAACAT
                                                                                                                                                                                                                                                                                                                              METHODS FOR DIAGNOSIS OF MYCOBACTERIAL INFECTIONS
                                                       No.
                                                                                 No.
                                                                                5985287
                                                      08/705,347
                                                                                08/873,970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1436
                         Qγ
                                                     망
                                                                             δõ
                                                                                                                                δÃ
    밁
                                                                                                        B
                                                                                                                                                           B
                                                                                                                                                                                  Qy
                                                                                                                                                                                                             B
                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                          дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            us-08-997-362-159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 42.4
Best Local Similarity 65.6
Matches 1035; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INFORMATION FOR SEQ ID NO:
    786
                                                                                                          666
                                                                                                                                                                                      603
                                                                                                                                                                                                               546
                                                                                                                                                                                                                                                                                                                      426
                                                                                                                                                                                                                                                                                                                                                                         366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: nucleic STRANDEDNESS: TOPOLOGY: line
                           783
                                                                                                                                                                                                                                                                  486
                                                                                                                                                                                                                                                                                           483
                                                                                                                                                                                                                                                                                                                                             423
                                                                                                                                                                                                                                                                                                                                                                                                  363
                                                                                                                                                                                                                                                                                                                                                                                                                            306
                                                                                                                                                                                                                                                                                                                                                                                                                                                   303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6
  CAACAAGATCCGCGGCACCTTCAAGTCCGTCGCCGTCAAGGCTCCGGGGCTTCGGTGACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          linear
```

```
REFERENCE/DOCKET NUMBER: 11
TELECOMMUNICATION INFORMATION:
TELEPHONE: 206-269-0565
TELEPAX: 206-269-0563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
caacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
                                                                                                                                                                                                                                                                                                                                                                                       tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                                           taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                        CTCCAAGGTGTCGACCGTCAAGGATCTGCTCCCGCTGCTGGAGAAGGTCATCCAGGCCGG
                                                                                                                                                                agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                CCTGCAGCTCGAGCTCACCGAGGGTATGCGCTTCGACAAGGGCTACATCTCGGGTTACTT
                                                                                                                                                                                                                                                                                                                              caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GATTTCTGCCACCGCGGCGATTTCCGCCGGCGACACCCAGATCGGCGAGCTCATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg ·122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCCACGCTGGTGGT
                                                                                                                                                                                                                        CGTGACCGACGCCGAGCGCCAGGAAGCCGTCCTGGAGGATCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGTCGAGGCTGTCACCCAGTCGCTGCTGAAGTCGGCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCTGCGCAACGTCGCAGCCGGCGCCAACCCGCTCGGCCTCAAGCGTGGCATCGAGAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGTCGCGGGCGACGGCCACCACCGCCACCGTGCTCGCTCAGGCTCTGGTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTGGGGCGCCCCCACGATCACCAACGATGGTGTGTCCATCGCCAAGGAGATCGAGCTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGCAGACGCCGTAAAGGTGACGTTGGGCCCCGAAGGGTCGCAACGTCGTGCTGGAGAAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CAAGACAATTGCGTATGACGAAGAGGCCCGCCGTGGCCTCCGAGCGGGGCCTCAACGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGACCCGTACGAGAAGATCGGCGCTGAGCTGGTCAAAGAGGTCGCCAAGAAGACCGACGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1626 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        42.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11000.1002c2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 685.6; DB 2;
Pred. No. 6.3e-136;
0; Mismatches 534;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1626;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    185
             842
                                                                                                                                                                                                                        665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    125
                                                      785
                                                                                               782
                                                                                                                                        725
                                                                                                                                                                               722
                                                                                                                                                                                                                                                                  662
                                                                                                                                                                                                                                                                                                         605
                                                                                                                                                                                                                                                                                                                                                  602
                                                                                                                                                                                                                                                                                                                                                                                             545
                                                                                                                                                                                                                                                                                                                                                                                                                                  542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3 p 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              365
```

망

ρy 멍 ρy В Qγ В Q

```
US-09-095-855-159
                                                                                                                                                                                                                                               Patent No. 6160093
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                       Sequence 159, Application Patent No. 6160093
                                                                                  TITLE OF INVENTION: Compounds TITLE OF INVENTION: Treatment NUMBER OF SEQUENCES: 208
                                                                                                                                                                        APPLICANT: Tan, Paul
APPLICANT: Visser, Elizabeth
APPLICANT: Skinner, Margot
APPLICANT: Prestidge, Ross
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             903
                                            STREET: 2601 I
COUNTRY: U
ZIP: 98121
                                 STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgttgt 1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGTCCGCGTGGCGCTCGGCTCCAAGCAGATCGCCTTCAACGGCGGCCTGGAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgacaagccggccaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGTCACCAAGGACGAGACCACCATCGTCGAGGGCTCGGGGGGATTCCGATGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                              CGACAAGCCGGAGAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGCGCTGCAGAACGCGGCGTCCATCGCGGCTCTGTTCCTCACCACCGAGGCCGTCGTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGGTGAGTACGAGGACCTGCTCAAGGCCGGCGTCGCCGGTGAAGGTCACCCGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGGCGTCGTTGCCGAGAAGGTGTCCAACCTGCCCGCGGGTCACGGCCTCAACGCCGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGCTGCCGTCGAAGAGGGCATCGTCGCCGGTGGCGGCGTGGCTCTGCTGCAGTCGGCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CACCGAGGTGGAGCTCAAGGAGCGCAAGCACCGCATCGAGGACGCCGTCCGCAACGCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCTGCAGGAGCGCCTGGCCAAGCTGGCCGGCGGTGTTGCCGGTGATCAAGGCCCGGAGCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCGGGTGGCTCAGATCCGCGCCGAGATCGAGAACAGCGACTCCGACTACGACCGCGAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ggtcagcaaggacgacaacggtcattgtcgacggcggcggcagcacgcagaagcggttggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgccggcattgtgctgcgcgaggtggggcttggaggtgctgggcctgggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCGCAAGGCGATGCTGCAGGACATGGCCATCCTCACCGGTGGTCAGGTCGTCAGCGAAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AGTCGGGCTGTCCCTGGAGACCGCCGACGTCTCGCTGCTGGGCCAGGCCCGCAAGGTCGT
                                 WA
                                                                   2601 Elliott Avenue,
                USA
                                                                                                                                        Compounds and 
Treatment and
                                                                                                                                                                                                                                                                                      US/09095855
                                                                                                                                                                                                                                                                                                                                                                              1574
                                                                                                                                                                                                                                                                                                                                                                                                                1580
                                                                                                                                        Methods for Diagnosis o
                                                                                                                                          of
                                                                                                                                          Mycobacterial Infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1085
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            965
                                                                                                                  Ş
                                                                                                                                                         Ъ
                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                    В
                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-095-855-159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best Local Similarity Matches 1035; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: 08/873,970
FILLING DATE: 12-JUN-1997
APPLICATION NUMBER: 08/997,362
FILLING DATE: 23-DEC-1997
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
APPLICATION NUMBER:
FILING DATE: 29-AUG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: FastSEQ for Windows CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM: MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: nucleic
STRANDEDNESS:
TOPOLOGY: line
                486
                                                  483
                                                                                                                                                                                                                                  306
                                                                                                                                                                                                                                                                                                       246
                                                                                                                                                                                                                                                                                                                                           243
                                                                                                                                                                                                                                                                                                                                                                              186
                                                                                                                                                                                                                                                                                                                                                                                                              183
                                                                                                                                                                                                                                                                                                                                                                                                                                                   126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     123
                                                                                                                                                           366
                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                    303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH: 1626 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME: Sleath, Janet
REGISTRATION NUMBER: 37,007
REFERENCE/DOCKET NUMBER: 11000.1002c3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX: 206-269-0563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CAAGACAATTGCGTATGACGAAGAGGCCCGCCGTGGCCTCGAGCGGGGCCTCAACGCCCT 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               caagctgatcgaatacgacgaaaaccgcgcgcgtcgcgccatggaggtcggcatggacaagct 62
                GGCCATGGACAAGGTCGGCAACGAGGGTGTCATCACCGTCGAGGAGTCGAACACCTTCGG
                                                                                                                                                                                                                                                                                                                                                                              GGACCCGTACGAGAAGATCGGCGCTGAGCTGGTCAAAGAGGTCGCCAAGAAGACCGACGA
                                                                                                                                                                                                                                                                                                                                                                                             agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGCAGACGCCGTAAAGGTGACGTTGGGCCCGAAGGGTCGCAACGTCGTGCTGGAGAAGAA 125
                                 agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
                                                                                                     catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga 482
                                                                                                                                                                            cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                  CCTGCGCAACGTCGCAGCCGGCGCCAACCCGCTCGGCCTCAAGCGTGGCATCGAGAAGGC
                                                                                                                                                                                                                                                   cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                     CGTCGCGGGCGACGACCACCGCCACCGTGCTCGCTCAGGCTCTGGTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                        tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggccgacaccgtgcgggtgacgctggggccgcgcggcatgtgggtgctggccaaggc 122
                                                                                                                                                           TGTCGAGGCTGTCACCCAGTCGCTGCTGAAGTCGGCCAAGGAGGTCGAGACCAAGGAGCA 425
                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTGGGGCGCCCCCACGATCACCAACGATGGTGTCTCCATCGCCAAGGAGATCGAGCTGGA 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29-AUG-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    42.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         us/09/095,855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     08/705,347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; Score 685.6; 1; Pred. No. 6.3e. 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .3e-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 3;
e-136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   534;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
```

9

Gaps

2

362 365

485

545

302 245

305

皮 Š В ρ DЬ õ В δÃ 밁 Qy В Ωy 망

```
밁
                                                    В
                                                                         δõ
                                                                                                                              QY
                                                                                                                                                                                 Q
                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                          Ω
                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                      γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
밁
                      õ
                                                                                                      g
                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
1557
                                                                                                         1437
                                                                                                                                                               1377
                                                                                                                                                                                                                                                                        1266
                                                                                                                                                                                                                                                                                                  1263
                                                                                                                                                                                                                                                                                                                              1206
                                                                                                                                                                                                                                                                                                                                                                                    1146
                                                                                                                                                                                                                                                                                                                                                                                                              1143
                                                                                                                                                                                                                                                                                                                                                                                                                                          1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    543
                                                                                                                                                                                                                               gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgcttggcttggacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCCAGGCCCTGTCCACGCTGGTGGT
                                                 cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggttgactaggtc
                                                                                                                                                                          caaggcgctgaccgaactgcgtgcgtgcctcgctgaccggtgtcctcggttgtcgacgt
                                                                                                                                                                                                                                                                                                                                                                                                caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatggaggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAACAAGATCCGCGGCACCTTCAAGTCCGTCGCCGTCAAGGCTCCGGGGCTTCGGTGACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              caacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
CGACAAGCCGGAGAAGGC
              cgacaagccggccaaggc 1580
                                                                                                                                                           CGGCGTCGTTGCCGAGAAGGTGTCCAACCTGCCCGCGGGTCACGGCCTCAACGCCGCGAC
                                                                                                                                                                                                                 CGTCCGCGTGGCGCTCGGCTCCAAGCAGATCGCCTTCAACGGCGGCCTGGAGCC
                                                                                                                                                                                                                                                                       T---GCGCTGGACGACCTCGGC-----CTGACGGGCGACGAGGCCACCGGTGCCAACAT
                                                                                                                                                                                                                                                                                                                                           ggccgcggtcgaggagggcatcgtccctggtggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGTCACCAAGGACGAGACCACCATCGTCGAGGGCTCGGGGCGATTCCGATGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGTCGGGCTGTCCCTGGAGACCGCCGACGTCTCGCTGGCTCGGGCCAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                      CGGTGAGTACGAGGACCTGCTCAAGGCCGGCGTCGCCGACCCGGTGAAGGTCACCCGCTC
                                                                                                                                                                                                                                                                                                                                                                                   CACCGAGGTGGAGCTCAAGGAGCGCCAAGCACCGCATCGAGGACGCCGTCCGCAACGCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                         GCTGCAGGAGCGCCTGGCCAAGCTGGCCGGCGGTGTTGCGGTGATCAAGGCCGGAGCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCGGGTGGCTCAGATCCGCGCCGAGATCGAGAACAGCGACTCCGACTACGACCGCGAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CTCCAAGGTGTCGACCGTCAAGGATCTGCTCCCGCTGCTGGAGAAGGTCATCCAGGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                           GGCTGCCGTCGAAGAGGGCATCGTCGCCGGTGGCGGCGTGGCTCTGCTGCAGTCGGCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGTGACCGACGCCGAGCGCCAGGAAGCCGTCCTGGAGGATCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCTGCAGCTCGAGCTCACCGAGGGTATGCGCTTCGACAAGGGCTACATCTCGGGTTACTT
1574
                                                                                                                                                                                                                                                                                                1322
                                                                                                                                                                                                                                                                                                                                                                                                                                         1145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1022
                                                                                                                                                                                      1442
                                                                                                                                                                                                                 1376
                                                                                                                                                                                                                                                                       1316
                                                                                                                                                                                                                                                                                                                           1265
                                                                                                                                                                                                                                                                                                                                                        1262
                                                                                                                                                                                                                                                                                                                                                                                   1205
                                                                                                                                                                                                                                                                                                                                                                                                              1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1085
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1025
                                                                                                      1496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       605
```

```
밁
                         ρ
                                                         В
                                                                                 ρy
                                                                                                                Вp
                                                                                                                                           Qy
                                                                                                                                                                            뫄
                                                                                                                                                                                                      QY
                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-997-080-113
                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity Matches 1030; Conserv
                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 113, Application US/08997080 Patent No. 5968524
                                                                                                                                                                                                                                                                                                                                                                                                                                        TOPOLOGY: 1:
MOLECULE TYPE:
-08-997-080-113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:

NAME: Sleath, Janet
REGISTRATION NUMBER: 37,007
REFERENCE/DOCKET NUMBER: 1100
TELECOMMUNICATION INFORMATION:
TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
SOFTWARE: FastsE0 for Windows Version
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: ME NUMBER OF SEQUENCES: 1 CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: WATSON, JA
APPLICANT: TAN, PAUL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
306
                            303
                                                                                                                  186
                                                                                       243
                                                                                                                                                183
                                                                                                                                                                             126
                                                                                                                                                                                                          123
                                                                                                                                                                                                                                         66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STREET: 2601 I
                                                                                                                                                                                                                                                                     63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LENGTH: 1569 base
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                   6
                                                                                                                                                                                                                                                                                                                 3 caagetgategaataegaegaaaeeegeegtegeegeeatggaggteggeatggaeaaget 62
               agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaacgaccaacga
                                                                                                                                                                                            gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga 182
                                                                                                                                                                                                                                                       99ccgacaccgtgcgggtgacgctggggccgccggccggcatgtggttgctggccaaggc 122
CCTGCGCAACGTCGCAGCCGGCGCCAACCCGCCTCGGCCTCAAGCGTGGCATCGAGAAGGC
                                                         CGTCGCGGGCGACGGCACCACCGCCACCGTGCTCGCTCAGGCTCTGGTTCGCGAAGG
                                                                         tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                  GGACCCGTACGAGAAGATCGGCGCTGAGCTGGTCAAAGAGGTCGCCAAGAAGACCGACGA
                                                                                                                                                                            GTGGGGCGCCCCACGATCACCAACGATGGTGTGTCCATCGCCAAGGAGATCGAGCTGGA
                                                                                                                                                                                                                                       CGCAGACGCCGTAAAGGTGACGTTGGGCCCCGAAGGGTCGCAACGTCGTGCTGGAGAAGAA
                                                                                                                                                                                                                                                                                                CAAGACAATTGCGTATGACGAAGAGGCCCGCCGTGGCCTCGAGCGGGGCCTCAACGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2601 Elliott Avenue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             206-269-0563
                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Law Offices of Ann
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Genomic DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JAMES
VUL L.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        METHODS AND
                                                                                                                                                                                                                                                                                                                                                                           42.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/08/997,080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ۵
                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                           Score 681.8; DB 2;
Pred. No. 3.9e-135;
0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11000.1007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Suite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPOUNDS FOR THE TREATMENT OF IMMINOLOGICALLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Speckman
te 4185
                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                           1569;
                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                       125
365
                            362
                                                         305
                                                                                    302
                                                                                                                  245
                                                                                                                                              242
                                                                                                                                                                             185
                                                                                                                                                                                                                                                                                                   65
```

```
Q
                                                                                                                       В
                                                                                                                                                  δÃ
                                                                                                                                                                                      밁
                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                            ģ
                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЪ
                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
맑
                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                      1146
                                                                                                                                                                                                                                                                                                                                                1083
                                                                                                                                                                                                                                                                                                                                                                                                               1023
                                                                                                                                                                                                                                                                                                                                                                                1026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         906
                                                                                                                                                                                                                                                                                                                                                                                                                                              966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   366
                                                                             gttetecgaageeettgeegeegttgttetggategeegeeaaegetggettggaegg 1382
                                                                                                                                        caaggcgctgaccgaactgcgtgcgtcgctgaccggtgacggaggtcctcggtgtcgacgt 1322
                                                                                                                                                                                                                                                                                                                                  ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaa 1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 taagccactactgatcgtggctgaagacgtggaagggcgaagcgttggcgacgctggtcgt 782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ctcggtggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtgaacac 1442
                                                            CGTCCGCGTGGCGCTCTCGGCTCCAAGCAGATCGCCTTCAACGGCGGCCTGGAGCC
                                                                                                                         T---GCGCTGGACGACCTCGGC-----CTGACGGGCGACGAGGCCACCGGTGCCAACAT
                                                                                                                                                                                                     ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg 1262
                                                                                                                                                                                                                                                                   caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccaa 1202
                                                                                                                                                                                                                                                                                                                                                                                CCGGGTGGCTCAGATCCGCGCCGAGATCGAGAACAGCGACTCCGACTACGACCGCGAGAA 1085
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AGTCGGGCTGTCCCTGGAGACCGCCGACGTCTCGCTGCTGGGCCCAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgccggcattgtgctgcgcgaggtggggcttggaggtgctgggctcggcccgacgcgtggt 962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccgtaaggcgttccttgaggacctggcggtggtgacgggttggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCCGAGGCCCTGTCCACGCTGGTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
CGGCGTCGTTGCCGAGAAGGTGTCCAACCTGCCCGCGGGTCACCGCCTCAACGCCGCGAC
                                                                                                                                                                                      GGCTGCCGTCGAAGAGGGCATCGTCGCCGGTGGCGGCGTGGCTCTGCTGCAGTCGGCTCC
                                                                                                                                                                                                                                                      CACCGAGGTGGAGCTCAAGGAGCGCCAAGCACCGCATCGAGGACGCCGTCCGCAACGCGAA
                                                                                                                                                                                                                                                                                                                   GCTGCAGGAGCGCCTGGCCAAGCTGGCCGGCGGTGTTGCCGGTGATCAAGGCCCGGAGCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                              CGTCACCAAGGACGAGACCACCATCGTCGAGGGCTCGGGCGATTCCGATGCCATCGCCGG 1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGCAAGGCGATGCTGCAGGACATGGCCATCCTCACCGGTGGTCAGGTCGTCAGCGAAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTCCAAGGTGTCGACCGTCAAGGATCTGCTCCCGCTGCTGGAGAAGGTCATCCAGGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGTGACCGACGCCGAGCGCCAGGAAGCCGTCCTGGAGGATCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCTGCAGCTCGAGCTCACCGAGGGTATGCGCTTCGACAAGGGCTACATCTCGGGTTACTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGCCATGGACAAGGTCGGCAACGAGGGTGTCATCACCGTCGAGGAGTCGAACACCTTCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GATTTCTGCCACCGCGGCGATTTCCGCCGGCGACACCCCAGATCGGCGAGCTCATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      545
                                                                                                                                                                                                                                                      1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              725
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                          ; MOLECULE TYPE: US-08-997-362-113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 9
US-08-997-362-113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sequence 113, Application US/08997362
Patent No. 5985287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Patent No.
                                              Matches 1030;
                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL
                                                                                                                                                                                                                                       INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                NAME: Sleath, Janet REGISTRATION NUMBER: 37,007 REFERENCE/DOCKET NUMBER: 11/TELECOMMUNICATION INFORMATION: TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
SOFTWARE: FASTEED for Windows
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/997,
                                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION NUMBER: U.S. Patent Application FILING DATE: June 12, 1997
APPLICATION NUMBER: U.S. Patent Application APPLICATION NUMBER: U.S. Patent Application FILING DATE: August 29, 1996
ATTORNEY AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: Tan, Paul
APPLICANT: Hiyama, Jun
APPLICANT: Visser, Elizabeth
APPLICANT: Skinner, Margot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CORRESPONDENCE ADDRESS:
ADDRESSEE: Law Offices of Ann W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1497
                                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION: COMPOUNDS AND TITLE OF INVENTION: TREATMENT AND NUMBER OF SEQUENCES: 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: Scott, Line APPLICANT: Prestidge,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STREET: 2601 E
CITY: Seattle
STATE: WA
                                                                                                                                                        TYPE: nucleic
STRANDEDNESS:
TOPOLOGY: lin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COUNTRY:
ZIP: 981
                                                                                                                                                                                                                                                                                                                                                                                                                                                                FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                       TELEFAX: 206-269-0563
                                                                                                                                                                                                        LENGTH:
              w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggccatggacaagct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggt 1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGCGCTGCAGAACGCGGCGTCCATCGCGGCTCTGTTCCTCACCACCGAGGCCGTCGTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGGTGAGTACGAGGACCTGCTCAAGGCCGGCGTCGCCGACCCGGTGAAGGTCACCCGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INFORMATION:
                                                             Similarity
                                                                                                                                                                                     nucleic acid
                                                                                                                                                                                                        1569 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2601 Elliott Avenue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scott, Linda
                                              Conservative
                                                                                                                                                         linear
                                                                                                                                         Genomic DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1573
                                                                                                                                                                     single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1567
                                                           42.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/08/997,362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ross
                                            Score 681.8; DB 2;
Pred. No. 3.9e-135;
0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                       11000.1002c2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Suite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    METHODS FOR DIAGNOSIS OF MYCOBACTERIAL INFECTIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Speckman
                                                                                                                                                                                                                                                                                                                                                                                                    No.
                                                                                                                                                                                                                                                                                                                                                                                                                                  No.
                                              Indels
                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                    5985287
                                                                                                                                                                                                                                                                                                                                                                                                                                  5985287
                                                                               1569;
                                                                                                                                                                                                                                                                                                                                                                                                    08/705,347
                                                                                                                                                                                                                                                                                                                                                                                                                                  08/873,970
                                               9;
                                                                                                                                                                                                                                                                               .-
                                              Gaps
              62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1502
                                               Ŋ
```

멍

6

CAAGACAATTGCGTATGACGAAGAGGCCCGCCGTGGCCTCGAGCGGGGCCTCAACGCCCT

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                  δõ
                                             В
                                                                                          Вþ
                                                                                                                                    В
                                                                                                                                                     Qy
                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                        Дd
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
   1086
                         1083
                                              1026
                                                                   1023
                                                                                           966
                                                                                                             963
                                                                                                                                      906
                                                                                                                                                                                846
                                                                                                                                                                                                     843
                                                                                                                                                                                                                                                                                                                   999
                                                                                                                                                                                                                                                                                                                                        663
                                                                                                                                                                                                                                                                                                                                                              606
                                                                                                                                                                                                                                                                                                                                                                                    603
                                                                                                                                                                                                                                                                                                                                                                                                           546
                                                                                                                                                                                                                                                                                                                                                                                                                                                        486
                                                                                                                                                           903
                                                                                                                                                                                                                            786
                                                                                                                                                                                                                                                 783
                                                                                                                                                                                                                                                                       726
                                                                                                                                                                                                                                                                                             723
                                                                                                                                                                                                                                                                                                                                                                                                                                543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              63
                                                                                                                                                                                                                         CAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCCACGCTGGTGGT
GCTGCAGGAGCCCTGGCCAAGCTGGCCGCCGGTGTTGCGGTGATCAAGGCCGGAGCTGC
            CCGGGTGGCTCAGATCCGCGCGAGATCGAGAACAGCGACTCCGACTACGACCGCGAGAA
                                                                                        CGTCACCAAGGACGAGCCACCATCGTCGAGGGCTCGGGCGATTCCGATGCCATCGCCGG
                                                                                                    ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                               CCGCAAGGCGATGCTGCAGGACATGGCCATCCTCACCGGTGGTCAGGTCGTCAGCGAAAG
                                                                                                                                                                                            ccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                                 taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                             CGTGACCGACGCCGAGCGCAGGAAGCCGTCCTGGAGGATCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                                                                                                                        cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                         CCTGCAGCTCGAGCTCACCGAGGGTATGCGCTTCGACAAGGGCTACATCTCGGGTTACTT
                                                                                                                                                                                                                                                                                                                                                                                                                     caccgagttggagttcaccgaaggtattggcttccacaaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  agcgatgaacaaggtcggccacgacagcgtggtcagggtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GATTTCTGCCACCGCGGCGATTTCCGCCGGCGACACCCAGATCGGCGAGCTCATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              catcgcgcaggtggcgacggtgtcctcgcgcgagcgagcagatcggtgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCTGCGCAACGTCGCAGCCGGCCCAACCCGCTCGGCCTCAAGCGTGGCATCGAGAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgttgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGTCGCGGGCGACCACCACCACCGCCACCGTGCTCGCTCAGGCTCTGGTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AGTCGGGCTGTCCCTGGAGACCGCCGACGTCTCGCTGCTGGGCCAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGCCATGGACAAGGTCGGCAACGAGGGTGTCATCACCGTCGAGGAGTCGAACACCTTCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TGTCGAGGCTGTCACCCAGTCGCTGCTGAAGTCGGCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9ttt9gcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                   1082
                                                                                                             1022
                                                                                                                                                                                                                                                                                                                                                                                  662
  1145
                                             1085
                                                                                        1025
                                                                                                                                                                                                                                               842
                                                                                                                                                                                                                                                                                            782
                                                                                                                                                                                                                                                                                                                                                                                                                                602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       482
                                                                                                                                     965
                                                                                                                                                                               905
                                                                                                                                                                                                                          845
                                                                                                                                                                                                                                                                     785
                                                                                                                                                                                                                                                                                                                                       722
                                                                                                                                                                                                                                                                                                                                                              665
                                                                                                                                                                                                                                                                                                                                                                                                         605
                                                                                                                                                                                                                                                                                                                                                                                                                                                      545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                122
                                                                                                                                                                                                                                                                                                                  725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                245
```

δ

Š

δð

밁

δõ

δ

```
US-09-095-855-113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 113,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
       APPLICATION NUMBER: 08/705
FILING DATE: 29-AUG-1996
APPLICATION NUMBER: 08/873
FILING DATE: 12-JUN-1997
APPLICATION NUMBER: 08/997
FILING DATE: 23-DEC-1997
ATTORNEY/AGENT INFORMATION:
NAME: Sleath, Janet
REGISTRATION NUMBER: 37.00
REFERENCE/DOCKET NUMBER: 17.00
                                                                                                                                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
SOFTWARE: FASTSEQ for W
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/
FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Tan, Paul
APPLICANT: Visser, Elizabeth
APPLICANT: Skinner, Margot
APPLICANT: Prestidge, Ross
TITLE OF INVENTION: Compounds a
TITLE OF INVENTION: Treatment a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1203
TELECOMMUNICATION INFORMATION:
                                                                                                                                                               PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1563
                                                                                                                                                                                                                                                                                                                     COUNTRY: USA
ZIP: 98121
                                                                                                                                                                                                                                                                                                                                              ADDRESSEE: Law Offices of Ann
STREET: 2601 Elliott Avenue,
CITY: Seattle
STATE: WA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgacaagccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggattgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGACAAGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctcggtggttgatcaacaaggtcagcgagctacccgccgggcatgggctgaacgtgaacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGTCCGCGTGGCCGCTCCGCTCCAAGCAGATCGCCTTCAACGGCGGCCTGGAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   T--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caaggcgctgaccgaactgcgtgcgtgcgctgaccggtgtcctcggtgtcgacgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CACCGAGGTGGAGCTCAAGGAGCGCAAGCACCGCATCGAGGACGCCGTCCGCAACGCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGGTGAGTACGAGGACCTGCTCAAGGCCGGCGTCGCCGACCCGGTGAAGGTCACCCGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGGCGTCGTTGCCGAGAAGGTGTCCAACCTGCCCGCGGGTCACGGCCTCAACGCCGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGCTGCCGTCGAAGAGGGCATCGTCGCCGGTTGGCGGCGTCGCTCTGCTGCAGTCGGCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6160093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ·GCGCTGGACGACCTCGGC-----CTGACGGGCGACGAGGCCACCGGTGCCAACAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Application US/09095855
                                                                                                                                                                                                                                       FastSEQ for Windows
                                                                                                                                                                                                                                                                     IBM Compatible
                                                                  UMBER: 08/997,362
23-DEC-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1567
                                                                                                      08/873,970
-1997
                                                                                                                                               08/705,347
                                                                                                                                                                                                             US/09/095,
                          37,007
              11000
                                                                                                                                                                                                                                                                                                                                                                                          Ann
                                                                                                                                                                                                                                                                                                                                                                                                                                      and
                                                                                                                                                                                                                                                                                                                                                                              Suite 4185
                                                                                                                                                                                                             , 855
                                                                                                                                                                                                                                                                                                                                                                                            Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                      Methods for
Diagnosis o
                                                                                                                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                                                                                                      of Mycobacterial
                                                                                                                                                                                                                                                                                                                                                                                                                                        Intections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1316
```

```
Qy
                                                                                         В
                                                                                                          Qy
                                                                                                                                        B
                                                                                                                                                          QΥ
                                                                                                                                                                                      В
                                                                                                                                                                                                       γQ
                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                  ģ
                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                 Q
                                            밁
                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INFORMATION FOR SEQ ID NO: 11
SEQUENCE CHARACTERISTICS:
LENGTH: 1569 base pairs
TYPE: nucleic acid
STRANDENNESS: single
TOPOLOGY: linear
MOLECULE TYPE: Genomic DNA
IS-09-095-855-113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 1030; Conserv
                                                                                           666
                                              726
                                                                                                                 663
                                                                                                                                          909
                                                                                                                                                                                       546
                                                                                                                                                                                                             543
                                                                                                                                                                                                                                     486
                                                                                                                                                                                                                                                                                  426
 786
                     783
                                                                                                                                                               603
                                                                                                                                                                                                                                                           483
                                                                                                                                                                                                                                                                                                         423
                                                                                                                                                                                                                                                                                                                                366
                                                                                                                                                                                                                                                                                                                                                      363
                                                                                                                                                                                                                                                                                                                                                                             306
                                                                                                                                                                                                                                                                                                                                                                                                   303
                                                                                                                                                                                                                                                                                                                                                                                                                         246
                                                                                                                                                                                                                                                                                                                                                                                                                                                243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6
                                           agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                        CAACAAGATCCGCGGCACCTTCAAGTCCGTCGCCGTCAAGGCTCCGGGCTTCGGTGACCG
          caacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
                                                                                         CTCCAAGGTGTCGACCGTCAAGGATCTGCTCCCGCTGCTGGAGAAGGTCATCCAGGCCGG
                                                                                                                                        CGTGACCGACGCCGAGCGCCAGGAAGCCGTCCTGGAGGATCCCTACATCCTGCTGGTCAG
                                                                                                                                                    cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                       CCTGCAGCTCGAGCTCACCGAGGGTATGCGCTTCGACAAGGGCTACATCTCGGGGTTACTT
                                                                                                                                                                                                  caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                    GGCCATGGACAAGGTCGGCAACGAGGGTGTCATCACCGTCGAGGAGTCGAACACCTTCGG
                                                                                                                                                                                                                                                                                  GATTTCTGCCACCGCGGCGATTTCCGCCGGCGACACCCCAGATCGGCGAGCTCATCGCCGA
                                                                                                                                                                                                                                                                                               catcgcgcaggtggcgacggtgtcctcgcgcgagcagatcggtgacctggttggcga
                                                                                                                                                                                                                                                                                                                                            cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                             CCTGCGCAACGTCGCAGCCGGCGCCAACCCGCTCGGCCTCAAGCGTGGCATCGAGAAGGC
                                                                                                                                                                                                                                                                                                                                                                                         cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGACCCGTACGAGAAGATCGGCGCTGAGCTGGTCAAAGAGGTCGCCAAGAAGACCGACGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGCAGACGCCGTAAAGGTGACGTTGGGCCCGAAGGGTCGCAACGTCGTGCTGGAGAAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CAAGACAATTGCGTATGACGAAGAGGCCCGCCGTGGCCTCGAGCGGGCCTCAACGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGTCGAGGCTGTCACCCAGTCGCTGCTGAAGTCGGCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          : 206-269-0565
206-269-0563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      42.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 681.8; DB 3;
Pred. No. 3.9e-135;
0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                    842
                                                                  782
                                                                                                               722
                                                                                                                                                                                                             602
                                                                                                                                                                                                                                   545
                                                                                                                                                                                                                                                                                  485
                                                                                                                                                                                                                                                                                                        482
                                                                                                                                                                                                                                                                                                                                425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                            785
                                                                                                                                        665
                                                                                                                                                                                                                                                           542
                                                                                                                                                                                                                                                                                                                                                      422
                                                                                                                                                                                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                                                                                                                                                                                                               302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     185
                                                                                                                                                                                                                                                                                                                                                                            365
                                                                                                                                                                                                                                                                                                                                                                                                                          305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ņ
```

```
RESULT 11
US-08-461-775-8
                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δð
                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                         Sequence 8, Patent No. !
                                                                                                                                                  GENERAL INFORMATION:
APPLICANT: MAZODIER, Philippe
APPLICANT: GUGLIEMI, Gerard
TITLE OF INVENTION: REGULATORY
TITLE OF INVENTION: INITIATION
                                         CORRESPONDENCE ADDRESS:
ADDRESSEE: Burns, Doane, STREET: George Mason Bldg
CITY: Alexandria
STATE: Virginia
COUNTRY: United States
ZIP: 22313-1404
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                              1497
                                                                                                                                                                                                                                                                                                            1557
                                                                                                                                                                                                                                                                                                                                     1563
                                                                                                                                                                                                                                                                                                                                                                                         1503
                                                                                                                                                                                                                                                                                                                                                                                                                     1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1023
                                                                                                                                         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               843
                                                                                                                                                                                                                                                                                                                                                             ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggt 1562
                                                                                                                                                                                                                                                                                                                                                                                                                   ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaa 1082
                                                                                                                                                                                                                                                                                                                        cgacaagccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctcggtggtggtcaacaaggtcagcgagctaacccgccgggcatgggctgaacgtgaacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg 1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caaggcgctgaccgaactgcgttgcgtcgctgaccggtgacgaggtcctcggtgtcgacgt 1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caccgacaccgcactcaaggaggcgcaaggaaagcgtcgaggatgcggtcgcggccgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggtcagcaaggacgacaggtcattgtcgacggcggcggcaccgcagaagcggtggccaa 1022
                                                                                                                                                                                                                                                                                                           CGACAAGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGGCGTCGTTGCCGAGAAGGTGTCCAACCTGCCCGCGGGTCACGGCCTCAACGCCGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGTCCGCGTGGCGCTCCGCCTCAAGCAGATCGCCTTCAACGGCGGCCTGGAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGCTGCCGTCGAAGAGGGCATCGTCGCCGGTGGCGGCGTGGCTCTGCTGCAGTCGGCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CACCGAGGTGGAGCTCAAGGAGCGCCAAGCACCGCATCGAGGACGCCGTCCGCAACGCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGTCACCAAGGACGAGCCACCATCGTCGAGGGCTCGGGGCGATTCCGATGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgttggt 962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCGCAAGGCGATGCTGCAGGACATGGCCATCCTCACCGGTGGTCAGGTCGTCAGCGAAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AGTCGGGCTGTCCCTGGAGACCGCCGACGTCTCGCTGCTGGGCCAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                          , Application US/08461775 5858773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -GCGCTGGACGACCTCGGC-----CTGACGGGCGACGAGGCCACCGGTGCCAACAT
                                                                                                                                                                                                                                                                                                           1567
                                                                                                                                                                                                                                                                                                                                     1573
                                                                                                                                         15
                                                                                               Bldg.,
                                                                                                              Swecker &
                                                                                               Washington
                                                                                                                                                     NUCLEOTIDE SEQUENCE OF TRANSCRIPTION
                                                                                                & Prince
                                                                                                 Sts
                                                                                                                                                                    OF.
                                                                                                                                                                    THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       : 1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1316
                                                                                                                                                                                                                                                                                                                                                                                                                     1496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1436
```

606

723 666

```
В
                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                δõ
                                                밁
                                                                             δõ
                                                                                                             В
                                                                                                                                          δõ
                                                                                                                                                                             В
                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                            Б
                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; LOCATION:
US-08-461-775-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEFAX: (703) 836-202
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: PatentIn Rel
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 0
FILING DATE: 10-MAY-1993
                  544
                                                  487
                                                                               484
                                                                                                               427
                                                                                                                                             424
                                                                                                                                                                             367
                                                                                                                                                                                                             364
                                                                                                                                                                                                                                                                                                                                                                            187
                                                                                                                                                                                                                                             307
                                                                                                                                                                                                                                                                            304
                                                                                                                                                                                                                                                                                                            247
                                                                                                                                                                                                                                                                                                                                          244
                                                                                                                                                                                                                                                                                                                                                                                                         184
                                                                                                                                                                                                                                                                                                                                                                                                                                           127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAME: Crane-Feury, Sharon E
REGISTRATION NUMBER: 36,113
REFERENCE/DOCKET NUMBER: 010830-035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: FR 9011186 FILING DATE: 10-SEP-1990
                                                                                                                                                                                                                                                                                                       accyagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                                                          gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                        tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                 gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc
                                                                                                                                                                            GTCGCCGCCGTCTCCGCCGAGCTGCTCGACACCGCGCGCCCGATCGACGACAAGTCCGAC
                                                                                                                                                                                              9ccgacgoggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                          CTGCGCAACGTCGCCGCCGCCGCCCCCGGCCCTGAAGAAGGGCATCGACGCCGCC
                                                                                                                                                                                                                                                           ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc
                                                                                                                                                                                                                                                                                                                                                                         GACCCGTACGAGAACCTCGGCGCCCCAGCTCGTCAAGGAGGTGGCGACCCAAGACCAACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                       TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCGACACCGTCAAGGTGACCATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAGATTCTGAAGTTCGACGAGGACGCCCCGTCGCGCCCCTTGAGCGCGGCGTGAACCAGCTG
                                               GCGATGGACAAGGTCGGCAAGGACGGTGTCATCACCGTCGAGGAGTCCAACACCTTCGGT
                                                                                                             ATCGCCGCCGTCGCGCGCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        869;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (703) 836-6620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3) 6...
, 836-2021
, NO: 8:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  38.6%;
69.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PC-DOS/MS-DOS
n Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/08/461,775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                08/050,313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 623.8; DB 2;
Pred. No. 5.9e-123;
0; Mismatches 382;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1320;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                             486
                                                                                                                                                                          426
                                                                                                                                                                                                                                                                                                                                         303
                                                                                                                                                                                                                                                                                                                                                                                                                                       186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      66
                                                                                                                                                                                                                                            366
                                                                                                                                                                                                                                                                          363
                                                                                                                                                                                                                                                                                                          306
                                                                                                                                                                                                                                                                                                                                                                         246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1;
                                                                                                                                                                                                                                                                                                                                                                                      RESULT 12
US-09-031-606-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Db
                                                                                                                                                                                                                                                                                                                                                      Sequence 8, Application US/09031606 Patent No. 6153404
                                                                                                                                                                                                                                                                                                                                          GENERAL
                                                    COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
                                             SOFTWARE: Patentin Rel
CURRENT APPLICATION DATA
                                                                                                                                                                                                                                                                   APPLICANT: MAZODIER, Philippe APPLICANT: GUGLIEMI, Gerard TITLE OF INVENTION: REGULATORY TITLE OF INVENTION: INITIATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1027
                                                                                                                                                                                                                                          CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                        NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                907
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              664
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             778
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             727
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             724
                                                                                                                                          ZIP:
                                                                                                                                                                       STREET: George McCITY: Alexandria
STATE: Virginia
             APPLICATION NUMBER: FILING DATE:
                                                                                                                                                       COUNTRY:
                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccaaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggtgggt 1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cccgacgccggcattgtgctgcgcgaggtggcttggaggtgctgggctcggcccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gaccgccgtaaggcgttccttgaggacctggcggtggtgaccgggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gacaagalcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCCGCGCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCGGCCACCGAGGTCGAGCTGAAGGAGCGCCAAGCACCGTCTGGAGGACGCCCATCTCCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGCGTCTGCGTGATCCGCGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcgggattgggatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtggtggtcagcaaggacgacaggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GAGGAGGTCGGCCTCAAGCTCGACCAGGCCGGTCTGGACGTGCTGGGCACCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtccaaggggccgtacttcggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CAGGGCCGCGTCGCCCAGATCAAGGCCGAGATCGAGTCGACCCGACTCGGACTGGGACCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTCACCGTCACCAAGGACGACGACCATCGTGGACGGCGGCGGCAACGCCGAGGACGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTGGTCAACAAGATCCGCGGCACGTTCAACGCCGTCGCCGTCAAGGCGCCCGGCTTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGCAGAAGGTCATCCAGGCGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCGTACATG
                                                                                                                                                                                                                                                                                                                                       INFORMATION:
                                                                                                                                     1: Virginia
PRY: United States
22313-1404
                                                                                                                                                                                                       George Mason Bldg.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -aagccactactgatcgtggctgaagacgttggagggcgaagcgttggcgacgctg
                                                                                                                                                                                                                           Burns, Doane,
                                                                                                                                                                                                                                                        REGULATORY I
                              US/09/031,606
                                                                                                                                                                                                                         Swecker & Mathis
                                                                                                                                                                                                       Washington & Prince
                                                                                                                                                                                                                                                                         NUCLEOTIDE SEQUENCE OF TRANSCRIPTION
                                                           Version
```

#

Sts.

QF

1206

1197

1026

1017

966

906 897 846 837 786 777

957

```
Ş
                                             В
                                                                  δÃ
                                                                                              밁
                                                                                                                QУ
                                                                                                                                             Вb
                                                                                                                                                                  δÃ
                                                                                                                                                                                            망
                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                         녛
                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME/KEY:
LOCATION:
US-09-031-606-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 38.6%;
Best Local Similarity 69.1%;
Matches 869; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX: (703) 836-202:
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 1320 base pair:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
NAME: Crane-Feury, Sharon E
REGISTRATION NUMBER: 36,113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER: 010830-035
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 836-6620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION DATA:
APPLICATION NUMBER: 10-MAY-
                                                                                               487
                                               547
                                                                                                                     484
                                                                                                                                              427
                                                                                                                                                                                            367
  607
                                                                                                                                                                     424
                                                                                                                                                                                                                    364
                                                                                                                                                                                                                                            307
                                                                                                                                                                                                                                                                  304
                                                                                                                                                                                                                                                                                         247
                                                                                                                                                                                                                                                                                                                 244
                                                                                                                                                                                                                                                                                                                                         187
                                                                                                                                                                                                                                                                                                                                                                184
                                                                                                                                                                                                                                                                                                                                                                                        127
                                                                                                                                                                                                                                                                                                                                                                                                                124
                                                                                                                                                                                                                                                                                                                                                                                                                                        67
                                                                                                                                                                                                                                                                                                                                                                                                                                                              64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: FR 9 FILING DATE: 10-SEP-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4
                                             gcgatgaacaaggtcggccacgacagcgtggtcagggtcaaggaatcctccacgctgggc
                                                                                                                                                                                                        gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc 423
                                                                                                                                                                                                                                                        gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                             GCGATGGACAAGGTCGGCAAGGACGGTGTCATCACCGTCGAGGAGTCCAACACCTTCGGT
                                                                                                                                                          atcgcgcaggttggcgacggtgtcctcgcgcgacgagcagatcggttgacctggttggcgaa
                                                                                                                                                                                                                                                                                          ATCGCGGGTGACGGCACCACCGCGACCGTGCTGGCCCAGGCGCTGGTCCGCGAGGGC
                                                                                                                                                                                                                                                                                                       gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG
                                                                                                                                             ATCGCCGCCGTCGCCGCGCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG
                                                                                                                                                                                             GTCGCCGCCGTCTCCGCCGAGCTGCTCGACACCGCGCGCCCGATCGACGACAAGTCCGAC
                                                                                                                                                                                                                                            CTGCGCAACGTCGCCGGCGCGCCTCCCCGGCCGCCCTGAAGAAGGGCATCGACGCCGCC
                                                                                                                                                                                                                                                                                                                                                    gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat
                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCGACACCGTCAAGGTGACCATCGGCCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccgacaccgtgcgggtgacgctggggccgcgcggcatgtggtgctggccaaggcg 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (703) 836-2021
TD NO: 8:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
1..1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US ເ
1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FR 9011186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08/050,313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 623.8; DB 3; Pred. No. 5.9e-123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      382;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 1320;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                  543
                                                                     603
                                                                                             546
                                                                                                                                              486
                                                                                                                                                                                                                                                                  363
                                                                                                                                                                                                                                                                                                                303
                                                                                                                                                                                                                                                                                                                                        246
                                                                                                                                                                                                                                                                                                                                                              243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             63
                                                                                                                                                                                                                                            366
                                                                                                                                                                                                                                                                                         306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲.
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-08-461-775-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 9,
                                                                                                                                                                                                                                                                                                                                                                                                                                       Patent No.
                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
APPLICANT: MAZODIER,
APPLICANT: GUGLIEMI,
                                                                                                                                    MEDIUM TYPE: Floppy disk
COMPOTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                ZIP: 22313-1404
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                        CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1027
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1018
                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
ATTORNEY/AGENT INFORMATION
                                                                                                                                                                                                                                                STREET: George Mas
CITY: Alexandria
STATE: Virginia
COUNTRY: United St
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 907
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        778
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        727
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   664
            APPLICATION NUMBER: US 08/050,:
FILING DATE: 10 MAY-1993
APPLICATION NUMBER: FR 9011186
FILING DATE: 10-SEP-1990
                                                                                                         APPLICATION NUMBER: FILING DATE:
                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccaaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc 1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gaaaagcttggcgagctggccaaactggccggcggggttgctgtcatcaaggtgggt 1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcggattgggatcgg 1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gaccgccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaac 897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt 837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----aagccactactgatcgtggctgaagacgtggaagggcgaagcgttggcgacgctg 777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaygaacqqgt 723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCCGCGCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCGGCCACCGAGGTCGAGCTGAAGGAGCGCCAAGCACCGTCTGGAGGACGCCATCTCCGCG 1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGGCGTCTGCGTGATCCGCGTCGGC 1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CAGGGCCGCGTCGCCCAGATCAAGGCCGAGATCGAGTCGACCCGACTCGGACTGGGACCGC 1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTGGTCAACAAGATCCGCGGCACGTTCAACGCCGTCGCCGTCAAGGCGCCCGGCTTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                       , Application US/08461775 5858773
                                                                                                                                                                                                                                    RY: United States 22313-1404
                                                                                                                                                                                                                                                                                             E: Burns, Doa
George Mason
                                                                                                                                                                                                                                                                                                                                                         II, Gerard
REGULATORY
INITIATION
                                                                                                                                                                                                                                                                                                               Doane,
                                                                                                                                                                                                                                                                                                                                                                                                        Philippe
                                                                                                                                                                                                                                                                                                                                            15
                                                                                                                         US/08/461,775
                                                                                                                                                                                                                                                                                             Bldg.,
                                                          08/050,313
                                                                                                                                                                                                                                                                                           Swecker & Math
y., Washington
                                                                                                                                                                                                                                                                                                                                                            OF TRANSCRIPTION
                                                                                                                                                      Version
                                                                                                                                                                                                                                                                                             , Mathis
igton & F
                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                        #
                                                                                                                                                                                                                                                                                                Prince
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          846
```

```
DЪ
                                                                                                                                                                                                                                                                                                        рь
                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
 οy
                                    g
                                                                 Qy
                                                                                                     В
                                                                                                                                   ρy
                                                                                                                                                                      В
                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-461-775-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Sin
Matches 860;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEFAX: (703) 836-2021
INFORMATION FOR SEQ ID NO: 9:
SEQUENCE CHARACTERISTICS:
LENCTH: 2167 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: nucleic STRANDEDNESS: TOPOLOGY: line MOLECULE TYPE: I
                                                                                                       1515
                                                                                                                                                                        1455
                                                                                                                                                                                                                                           1395
                                                                                                                                                                                                                                                                                                            1335
                                                                                                                                                                                                                                                                                                                                                                             1275
                                                                                                                                                                                                                                                                                                                                                                                                                                                1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1095
                                    1575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELECOMMUNICATION INFORMATION: TELEPHONE: (703) 836-6620
                                                                                                                                         664
                                                                                                                                                                                                          604
                                                                                                                                                                                                                                                                           544
                                                                                                                                                                                                                                                                                                                                            484
                                                                                                                                                                                                                                                                                                                                                                                                             424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      accgagttggagttcaccgaaggtattggcttccacaaaaggcttcttgtcggcatacttc 603
                                                                                                                                                                                                                                                                                                                                                                                               atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa 483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCGACACCGTCAAGGTGACCATCGGCCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccgacaccgtgcgggtgacgctggggccgcgcggccatgtggtgctggccaaggcg 123
gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt 837
                                   GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG 1634
                                                                                                                       gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt 723
                                                                                                                                                                                          gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa 663
                                                                                                                                                                                                                                         GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCGTACATG 145
                                                                                                                                                                                                                                                                                                          GCGATGGACAAGGTCGGCAAGGACGGTGTCATCAACGTCGAGGAGTCCAACACCTTCGGT 1394
                                                                                                                                                                                                                                                                                                                            gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc 543
                                                                                                                                                                                                                                                                                                                                                                           ATCGCCGCCGCCGCGCCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG 1334
                                                                                                                                                                                                                                                                                                                                                                                                                                              GTCGCCGCCGTCTCCGCCGAGCTGCTCGACACCGCGCGCCCGATCGACGACAAGTCCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CTGCGCAACGTCGCCGGCGGCGCCTCCCCGGCCCCTGAAGAAGGGCATCGACGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATCGCGGGTGACGGCACCACCGCGACCGTGCTGGCCCAGGCGCTGGTCCGCGAGGGC 1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GACCCGTACGAGAACCTCGGCGCCCAGCTCGTCAAGGAGGTGGCGACCAAGACCAACGAC 1094
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC 1034
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa 183
                                                                                                     GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT 1574
                                                                                                                                                                      GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG 1514
                                                        -----aagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Crane-Feury, Sharon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       37.78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                36,113
ER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 609.4; 1; Pred. No. 6.9e 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  010830-035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6.9e-120;
ches 391;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     974
                                                                                                                                                                                                                                                                                                                                                                                                                                              1274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ۲.
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    us-09-031-606-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 9, Application Patent No. 6153404 GENERAL INFORMATION:
                                TELEFAX: (703) 836-20 INFORMATION FOR SEQ ID NO:
                                                          ATTORNEY/AGENT INFORMATION:
NAME: Crane-Feury, Sharon E
REGISTRATION NUMBER: 36,113
REFERENCE/DOCKET NUMBER: 010830-035
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 836-6620
                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SEQUENCE CHARACTERISTICS:
LENGTH: 2167 base pair
                                                                                                                                                                                                                                                                                                 SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: MAZODIER, Philippe
APPLICANT: GUGLIEMI, Gerard
TITLE OF INVENTION: REGULATORY
TITLE OF INVENTION: INITIATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1635
                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         898
                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: George Ma
CITY: Alexandria
STATE: Virginia
                                                                                                                                                                                 FILING DATE: 10-MA APPLICATION NUMBER:
                                                                                                                                                                                                                                                  FILING DATE: CLASSIFICATION:
                                                                                                                                                                                                                                                                                   APPLICATION NUMBER:
                                                                                                                                                                                                                APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gaaaagcttggcgagcggctggccaaactggccgggggttgctgtcatcaaggtgggt 1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCCGCGCCGCCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgc 957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGGCGTCTGCGTGATCCGCCTCGGC 1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAGGGCCGCGTCGCCCAGATCAAGGCCGAGATCGAGTCGACTCGACTCGGACTGGGACCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTCACCGTCACCAAGGACGACGACCATCGTGGACCTGGAGAAGGACGCCGAGGACGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGGCCACCGAGGTCGAGCTGAAGGAGCGCCAAGCACCGTCTGGAGGACGCCATCTCCGCG
                                                                                                                                                                                                                                                                                                                                                                                                   RY: United States 22313-1404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  George Mason Bldg.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Burns, Doane,
                                                                                                                                                                                                  10-MAY-1993
                                              836-2021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REGULATORY NUCLEOTIDE SEQUENCE INITIATION OF TRANSCRIPTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/09031606
                                                                                                                                                                                   FR 9011186
                                                                                                                                                                                                                   os 08/050,313
                                                                                                                                                                                                                                                                                 US/09/031,606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Swecker & Mathis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Washington & Prince
                                                                                                                                                                                                                                                                                                                  Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      897
```

```
밁
                                                                                                        Qy
                                                                                                                                    В
                                                                                                                                                      Qy
                                                                                                                                                                                  밁
                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; TYPE: nucleic acid
; STRANDEDNESS: single
; TOPOLOGY: linear
; MOLECULE TYPE: DNA (genomic)
US-09-031-606-9
            ş
                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 860;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                    1575
                                                                                                                                                                                                                                  1455
                                                                                                                                                                                                                                                                                                                               1335
                                                                                                                                                                                                                                                                                                                                                                                                                              1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1035
                                    1695
                                                                                                                                                                                   1515
                                                                                                                                                                                                                                                                                1395
                                                                                                                                                                                                                                                                                                                                                                               1275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1155
             898
                                                                                                                                                           724
                                                                                                                                                                                                                                                          604
                                                                                                                                                                                                                                                                                                       544
                                                                                                                                                                                                                                                                                                                                                      484
                                                                                                                                                                                                                                                                                                                                                                                                      424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         915
                                                                                                                                                                                                                                                                                                                                                                                                                                                    364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4 aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                  gaccgccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                            cccgacgccggcattgtgctgcgcgaggttgggcttggaggtgctgggctcggcccgacgc
                                    GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                               gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt
                                                                                                                                   GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCCCTGTCGACCCTG
                                                                                                                                               GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT
                                                                                                                                                                                                 gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt 723
                                                                                                                                                                                                                               GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG
                                                                                                                                                                                                                                              gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                                                                GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCGTACATG
                                                                                                                                                                                                                                                                                             accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                                                                                                                                              GCGATGGACAAGGTCGGCAAGGACGGTGTCATCAACGTCGAGGAGTCCAACACCTTCGGT 1394
                                                                                                                                                                                                                                                                                                                                         gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc 543
                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATCGCGGGTGACGGCACCACCACCGCGACCGTGCTGGCCCAGGCGCTGGTCCGCGAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCGACACCGTCAAGGTGACCATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTGCGCAACGTCGCCGGCGGCGCCTCCCCGGCCGCCCTGAAGAAGGGGCATCGACGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 37.7%;
68.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 609.4; DB 3; Pred. No. 6.9e-120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      391;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2167;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                   1694
                                                                                                          837
                                                                                                                                   1634
                                                                                                                                                                                  1574
                                                                                                                                                                                                                               1514
                                                                                                                                                                                                                                                        663
                                                                                                                                                                                                                                                                               1454
                                                                                                                                                                                                                                                                                                       603
                                                                                                                                                                                                                                                                                                                                                                            1334
                                                                                                                                                                                                                                                                                                                                                                                                                           1274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1094
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1034
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             63
                                                                                                                                                          777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1;
```

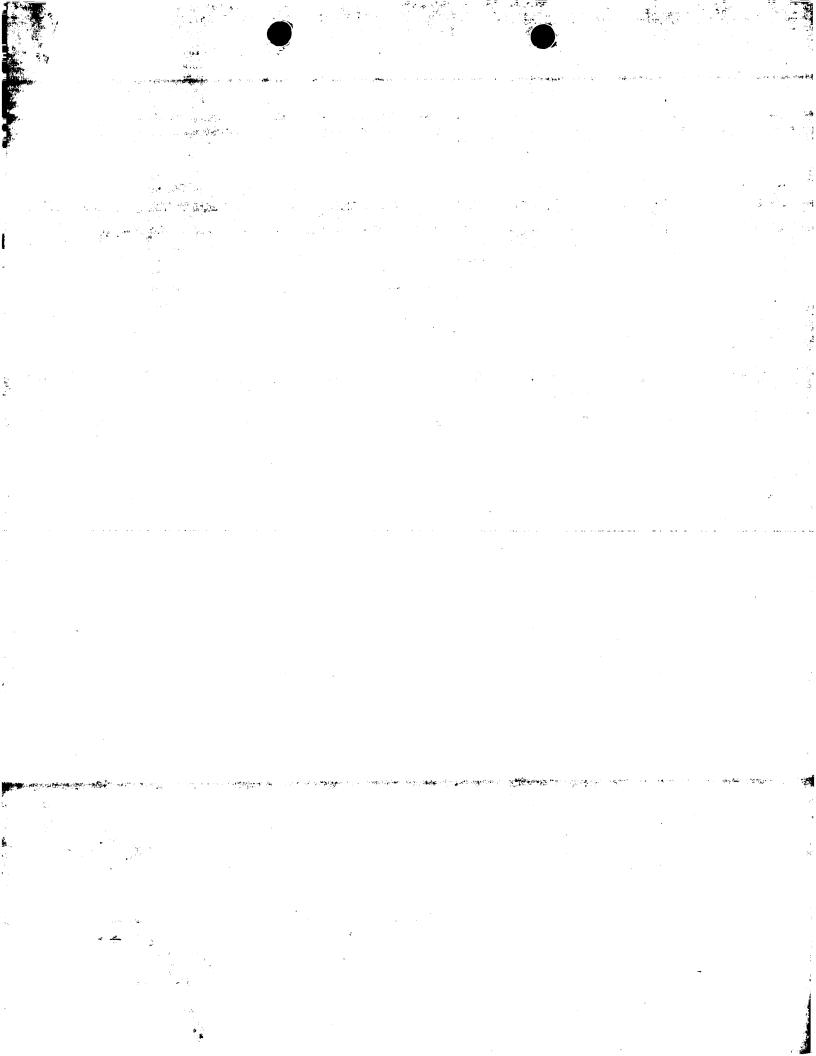
```
멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-08-997-080-161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                           US-08-997-080-161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 161, Application US/08997080 Patent No. 5968524
   Query Match
Best Local Similarity
Matches 615; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                     REFERENCE/DOCKET NUMBER: 11
TELECOMMUNICATION INFORMATION:
TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM: MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION: METHODS AND COMPOUNDS FOR NUMBER OF SEQUENCES: 194
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1078
                                                                                                                                                               SEQUENCE CHARACTERISTICS:
LENGTH: 985 base pairs
                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION: NAME: Sleath, Janet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: WATSO APPLICANT: TAN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDREET: 20.
STREET: 20.
Seattle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
SOFTWARE: FastSEQ for Windows
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNTRY: UZIP: 98121
                                                                                                             TOPOLOGY:
                                                                                                                            STRANDEDNESS: single
                                                                                                                                                                                                                                    TELEFAX: 206-269-0563
                                                                                                                                                                                                                                                                                                      REGISTRATION NUMBER: 37,007
                                                                                                                                                                                                                                                                                                                                                             FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                  FILING DATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccaaggccgcggtcgaggaggcatcgtccctggtgggggagcctcgctcatccac 1254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc 1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACCCGCGCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGGCGTCTGCGTGATCCGCGTCGGC 1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggtgggt 1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAGGGCCGCGTCGCCCAGATCAAGGCCGAGATCGAGTCGACTCGGACTCGGACTGGGACCGC 1934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgg 1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtggtggtcagcaaggacgacacggtcattgtcgacggcggcggcagcagaagcggtg 1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAGGAGGTCGGCCTCAAGCTCGACCAGGCCGGTCTGGACGTGCTGGGCCACCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCGGCCACCGAGGTCGAAGGAAGGAGCGCAAGCACCGTCTGGAGGACGCCATCTCCGCG 2054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTCACCGTCACCAAGGACGACGACCATCGTGGACCTGGAGAAGGACGCCGAGGACGTC
                                                                                                                                              nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2601 Elliott Avenue, Suite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WATSON, JAMES
       Conservative
                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Law Offices of Ann W. Speckman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PAUL
                       24.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   L.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                   US/08/997,080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                D.
                                                                                                                                                                                                   161:
   Score 395.2; DB 2;
Pred. No. 6.2e-75;
0; Mismatches 318;
                                                                                                                                                                                                                                                                                         11000.1007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               THE TREATMENT OF
                                      Length
       Indels
       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2111
Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IMMUNOLOGICALLY-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1814
         2;
```

õ

639 ggacgcgttgatcctgctacaccaagacaagatcagctcgcttcccgatctgttgccatt 698

```
δô
                                                               Qy
                                                                                        В
                                                                                                            δδ
                                                                                                                                                                             В
                                                                                                                                                                                                   Q
                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЪ
                     δÃ
                                           Дb
                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                      γQ
                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                  1479
                                                                                                                                                         1359
                                                                                                                                                                                                                                                1239
                                                                                                                                                                                                                                                                                            1179
                                                                                                                                                                                                                                                                                                                                     1119
                                                                                                              1419
                                                                                                                                                                                                     1299
                                                                                                                                                                                                                                                                                                                                                                                 1059
                                                                                                                                                                                652
                                                                                                                                                                                                                          601
                                              832
                                                                                         772
                                                                                                                                    712
                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                            999
                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      939
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <u>سر</u>
cgaagcgttggcgacgctggtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggt 818
                                                        cgacccggtcaaggtgactaggtcggcggtgttgaacgcgtcatcggtttgcccggatggt 1538
                                                                                                    cgggcatgggctgaacgtgaaccctgagctatggtgacttggccgctgacggcgtcat 1478
                                                                                                                                             cyccyccaacgctggcttggacggctcggtggtcgacaaggtcagccgagctacccgc 1418
                                                                                                                                                                                                                                                                  CGAGGACGCCGTCCGCAACGCGAAGGCTGCCGTCGAAGAGGGCATCGTCGCCGGTGGCGG
                                                                                                                                                                                                                                                                                                                                                                     cgattcggattgggatcgggaaaagcttggcgagcggctggccaaactggccggcggggt 1118
                                                                                                                                                                                                                                                                                                                                                                                                                 cggcaccgcagaagcggtggccaaccggggcgaaccacttgcgtgccgagatcgacaagag 1058
                                                                                                                                                                                                                                                                                                                                                                                                                                                             gctgggctcggcccgacgcgtggtggtcagcaaggacgacacggtcattgtcgacggcgg 998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGGTGGTCAGGTCGTCAGCGAAAGAGTCGGGGCTGTCCCTGGAGACCGCCGACGTCTCGCT 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         999t99ccacgtggtcaaccccgacgccggcattgtgctgcgcgaggtgggcttggaggt 938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGACCCGGTGAAGGTCACCCGCTCGGCGCGTCAGAACGCGGCGTCCATCGCGGCTCTGTT
                                                                                        GGGTCACGGCCTCAACGCCGCGACCGGTGAGTACGAGGACCTGCTCAAGGCCGGCGTCGC
                                                                                                                                   CGCCTTCAACGGCGGCCTGGAGCCCGGCGTCGTTGCCGAGAAGGTGTCCAACCTGCCCGC
                                                                                                                                                                                                                                                                                cgaggatgcggtcgcggccgccaaggccgcggtcgaggagggcatcgtccctggtggggg 1238
                                                                                                                                                                                                                                                                                                                                                         CGACTCCGACTACGACCGCGAGAAGCTGCAGGAGCGCCTGGCCCAAGCTGGCCGGCGGTGT 480
                                                                                                                                                                                                                                                                                                                                                                                                       GGGCGATTCCGATGCCATCGCCGGCCGGGTGGCTCAGATCCGCGCCGAGATCGAGAACAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                GCTGGGCCAGGCCCGCAAGGTCGTCGTCACCAAGGACGAGACCACCATCGTCGAGGGCTC 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGATCCCTACATCCTGCTCGGTCAGCTCCAAGGTCTCGACCGTCAAGGATCTGCTCCCGCT
                                                                                                                                   771
                                                                                                                                                                                                                                                                                                                                                                                                      420
                                            891
                                                                                                                                                                                                                                                                     600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
```

Search completed: January 12, Job time: 26251 sec 2001, 20:09:43



```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          btal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                           Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
               741.8
741.6
711.4
709.8
709.8
685.6
681.8
681.8
634.4
652.2
                                                                                                                                                                             Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N_Geneseq_36:*
1: /SID56/gcgda
2: /SID56/gcgda
3: /SID56/gcgda
4: /SID56/gcgda
5: /SID56/gcgda
6: /SID56/gcgda
                                                                                                                                                                           Query
Match
                                                                                                                                                                                                                                                                                                   8:
9:
10:
112:
12:
12:
13:
14:
15:
18:
19:
20:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
  480022 seqs, 187831343 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDENTITY_NUC Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-461-774-1
1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          January 12, 2001, 12:48:36; Search time 244.98 Seconds (without alignments) 2479.576 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 agcaagctgatcgaatacga....accacgggcacgcgcactga 1617
                                                                                                                                                                                                                                                                                            /SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1991.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1991.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1992.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1994.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1996.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1997.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /SIDS6/gcgdata/geneseq/geneseqn/NA1980.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1981.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1982.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1984.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1985.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1986.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1987.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1987.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /SIDS6/gcgdata/geneseq/geneseqn/NA1988.DAT:*
                                                                                                                                                                             Length DB
 2668
1620
4380
4260
4380
1626
1569
1569
1569
1569
1569
1569
1567
1320
  19
20
20
20
20
13
13
Q22485
Q22482
N80222
N81768
V05708
V34608
V34608
C211343
V34608
Q22481
7 T14265
                                                                                                                                                                           ij
                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Compugen Ltd
                                      Nucleotide sequenc
M. vaccae antigen
Nucleotide sequenc
Clone Y3178 insert
                                                                                        groEL-1 gene. Str
groEL-1 gene codin
Sequence of Mycoba
Sequence encoding
Mycobacterium tube
                                                                                                                                                                          Description
gro es el operon w
groEL-1 gene parti
Brevibacterium fla
                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
Q22485
```

Ċ						40		38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
	ע	95.	98.	05.		24	8	93	93	9	309.6	09.	w	335	ω	40	40.	46.	352.6	54.	361.4	370.8	80.	387.2	390.4	9	395.2	443		449	470.2	7	509.8
	رب د	12.1	12.3	12.7	۲.	13.9	7.	18.1	18.1	19.1	19.1	9.2	20.7	20.7	20.7	21.1	21.1	1.	21.8	1.			Ψ	23.9		24.1	٠	7.	7.	27.8	9	9	31.5
	580073	831	1777	1017	2242	2193	1038602	647	647	2223	2465	910715	2322	2284	2284	4972	1647	1724	1838	1838	3625	1654	5365	1661	927	927	985	1635	1635	1635	1635	1665	1662
ŀ	9	20	19	18	18	11		20	19	12	12	20	16	17	16	18	18	19	14	14	20	20	19	20	20	19	20	21	21	21	21	20	20
	T 1 2 2 1 0	V90856	V59425	V74577	T58403	Q04669	Z01425	Z11344	V34609	Q13137	Q13136	X20248	Q75321	T45681	Q90181	T69203	T69201	X14495	Q48734	Q47926	X12979	X86153	V52210	X86155	Z11345	V34610	Z11372	A13000	Z54508	254507	254509	X86152	\vdash
ијустрана уставна уставна		otide	Heat shock protein	Staphylococcus	2	٠.,	Complete genome		vaccae ant	operon.		ilia bu	t shock prot	H. pylori heat	Helicobacter pylo		wsonia i	bylori G	ne. H		erococcus		Streptococcus p	ig a	መ	۵	cleotide		seria	isseria	menin	encoding a	DNA encoding a
T COL		Suc	ein	aur	ס	nie	e se	enc	ue	Chlam	lam	rfe	nte	sho	lor	<u>11</u>	<u>11</u>	118	doc	ico	faeca	Str	pneu	Str	enc	'n	one.	it.	Tit.	he	Jit		Str

ALIGNMENTS

groEL-1 gene.

29-JUL-1992 (first entry)

Heat shock protein; HSP18;

Q22485 standard; DNA; 2668

ВP

Q22485;

Recombinant DNA contg. heat inducible promoter and heterologous WPI; 1992-114358/14 Mazodier P, 03-SEP-1991; Streptomyces albus. PSDB; R22363. (INSP) INST PASTEUR. 10-SEP-1990; 19-MAR-1992 WO9204452-A Guglielmi G; 90FR-0011186 91WO-FR00701 Location/Qualifiers 849..2468 /*tag= a /note= "Gro EL1 protein"

SXX CCC X PX PT

1017

1814

1874

```
Query Match
Best Local Sim
Matches 1101;
                 1635
                                                                                                                                                                                  1455
                                                                                                                                                                                                                                         1395
                                                                                                                                                                                                                                                                                                                                                                                                            1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1035
                                                                                                                            1515
                                                                                                                                                                                                                                                                                                                                                     1275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene - also vectors, transformed cells
proteins of Streptococcus albus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 2668 BP; 443 A; 948 C; 929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ç
                                                                                                                                                     664
                                                                                                                                                                                                                                                                                                                                                                               424
                                                                                                                                                                                                                                                                                                                         484
                                                                                                                                                                                                                                                                                                                                                                                                                                      364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    e sequence is that of the complete groEL-1 gene which codes for a 18 kDa heat shock protein HSP18. The gene actually codes for a kDa protein but this is subjected to post translation modifification give the 18 kDa HSP18 protein. See also Q22477-Q22486.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4
                                                                  ggctccaagccgctgctgatcatcgccgaggacgtcgagggcgaggcgttgtcgaccctg
                                                                                                                                     gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                                                                                                                                                                     accgagttggagttcaccgaaggtattggcttccaccaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                                                                                                                           gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggccltgcgcaacgtcgccgccctgaagaagggcatcgacgccccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gtggtcaacaagatccgcggcacgttcaacgccgtcgccgtcaaggcgcccggcttcggt
                           gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt
                                                                                                                        ggcaagatcggttcgatccaggacctgctgccgctgctggagaaggtcatccaggcgggt
                                                                                                                                                                              gtgaccgaccaggagcgtatggaggccgtcctcgacgacccgtacatcctgatccaccag
                                                                                                                                                                                              gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                      gtcgacctggacttcaccgagggcatggccttcgacaagggctacctgtccccgtacatg
                                                                                                                                                                                                                                                                                              gcgatggacaaggtcggcaaggacggtgtcatcaccgtcgaggagtccaacaccttcggt
                                                                                                                                                                                                                                                                                                                                                  atcgccgccgtcgccgcgctctccgcgcaggacaagcaggtcggcgagctcatcgccgag
                                                                                                                                                                                                                                                                                                                                                                  atcgcgcaggtggcgacggtgtcctcgcgcgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                                                                         gtcgccgccgtctccgccgagctgctcgacaccgcgcccgatcgacgacaagtccgac
                                                                                                                                                                                                                                                                                                                                                                                                                         gacccgtacgagaacctcggcgcccagctcgtcaaggaggtggcgaccaagaccaacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccgacaccgtcaaggtgaccatcggccccaagggccgcaacgtcgtcatcgacaagaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccgacaccgtgcgggtgacgctggggccgcggccggcatgtggtgctggccaaggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aagattctgaagttcgacgaggacgcccgtcgcgcccttgagcgcggcgtgaaccagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ttcggcgccccgaccatcaccaacgacggcgtcaccatcgcccgtgaggtcgagtgcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8; 50pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    45.9%;
67.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 741.8; DB 13;
Pred. No. 1.4e-125;
0; Mismatches 507;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           G; 348 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    new
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
               1694
                                                                    1634
                                                                                                                         1574
                                                                                                                                                     723
                                                                                                                                                                                  1514
                                                                                                                                                                                                            663
                                                                                                                                                                                                                                                                 603
                                                                                                                                                                                                                                                                                              1394
                                                                                                                                                                                                                                                                                                                        543
                                                                                                                                                                                                                                                                                                                                                   1334
                                                                                                                                                                                                                                                                                                                                                                               483
                                                                                                                                                                                                                                                                                                                                                                                                         1274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                1214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1094
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1034
                                                                                                                                                                                                                                                                                                                                                                                                                                     423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4.
                                                                                                                                                                                            RESULT
Q22482
 Ş
                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
CDS
                                                                                                                                                                                                                                                     2469
                                                                                                                                                                                                                                                                               1615
                                                                                                                                                                                                                                                                                                        2409
                                                                                                                                                                                                                                                                                                                                      1558
                                                                                                                                                                                                                                                                                                                                                                                            1498
                                                                                                                                                                                                                                                                                                                                                                                                                        2289
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1695
                                        Streptomyces
                                                                                                                         29-JUL-1992
                                                                                                                                                                               Q22482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 838
                                                                                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                               gccaaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       shock
                                                                                                                                                                                                                                                     tga
                                                                                                                                                                                                                                                                                 tga
                                                                                                                                                                                                                                                                                                                        gtggtcgacaagccggccaaggcagaagatcacgaccatcac---cacgggcacgcgcac
                                                                                                                                                                                                                                                                                                                                                                                                                                     gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccgccaccgacaccgccactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtcaccgtcaccaaggacgacacgaccatcgtggacggcggcggcgacgccgaggacgtc
                                                                                                                                                                                                                                                                                                         gtcgtcgagaagccggccgaggaggagcccgaggccggtcacggtcacgggcacagccac
                                                                                                                                                                                                                                                                                                                                                                                                                      gccaccggcgagtacggcgacctggtcaaggccggcgtcatcgacccggtcaaggtcacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gagggctacgtcatcaccaccaaggtggcggagctcgacaagggccagggcttcaacgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gacggctcggtggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gcggtcgtccgccgccgccgtcgagccgctgcgctggatcgccgagaacgccggcctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gcggccaccgaggtcgagctgaaggagcgcaagcaccgtctggaggacgccatctccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcggattgggatcgg 1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtggtggtcagcaaggacgacaaggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cccgacgccggcattgtgctgcgcgaggttgggcttggaggtgctgggctcggcccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gaggaggtcggcctcaagctcgaccaggccggtctggacgtgctgggcaccgccgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gaccgccgcaaggcgatgctcggcgacatggccaccctcaccggtgccaccgtcatcgcc
                                                                                                                                                                                  standard;
                                                                                              gene
                                                                                                                                                                                                                                                     2471
                                                                                                                                                                                                                                                                                 1617
                                                                    protein;
                                        albus
                                                                                              coding
                                                                                                                         (first
Location/Qualifiers 1..510
                                                                                                                                                                                  DNA;
                                                                                              region
                                                                    HSP18;
                                                                                                                        entry)
```

Qy 밁

Вb

Š

Ş 밁 Qy рь Qy В Qy Вр QΥ

2468

2288

2168

2054 1197

Qy 밁 Ωy В Qy ДЬ Ωy 밁 δÃ В

밁

```
ģ
                                                                                                                                                                             δõ
                                    Q
                                                   밁
                                                                δõ
                                                                                В
                                                                                          δõ
                                                                                                          В
                                                                                                                      Qy
                                                                                                                                      밁
                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                  SXCCCCXXXX
밁
          δÃ
                          g
                                                                                                                                                                                           뫄
                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Sim
Matches 1086;
                                                                                                                                                                                                                                                                                             The sequence is that of the coding region of the groEL-1 codes for the 18 kDa heat shock protein HSP18. The gene a codes for a 56 kDa protein but this is subjected to post modifification to give the 18 kDa HSP18 protein. See also Q22477-Q22486.
                                                                                                                                                                                                                                                                                                                                      Claim
                                                                                                                                                                                                                                                                                                                                                          Recombinant DNA contg. heat inducible promoter and heterologous gene - also vectors, transformed cells and new heat shock
                                                                                                                                                                                                                                                                                                                                                                                                              (INSP
                                                                                                                                                                                                                                                                                 Sequence 1620
                                                                                                                                                                                                                                                                                                                                                    proteins
                                                                                                                                                                                                                                                                                                                                                                                                   Mazodier
                                                                                                                                                                                                                                                                                                                                                                                                                            10-SEP-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                          03-SEP-1991;
 487
             484
                          427
                                        424
                                                     367
                                                                   364
                                                                                307
                                                                                                           247
                                                                                                                                                               127
                                                                                                                                                                             124
                                                                                              304
                                                                                                                        244
                                                                                                                                      187
                                                                                                                                                   184
                                                                                                                                                                                           67
                                                                                                                                                                                                                                                       / Match
Local Similarity
                                                                                                                                                                                                       64
aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcgggcatggacaagcttg
                                                    gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat
                                                                                                                                                                                                                                                                                                                                                                               1992-114358/14.
R22363.
                          atcgccgccgtcgccgcgctctccgcgcaggacaagcaggtcggcgagctcatcgccgag
                                atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                       ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc
                                                                                                                                     gacccgtacgagaacctcggcgcccagctcgtcaaggaggtggcgaccaagaccaacgac
                                                                                                                                                         tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                                                                                                                                                                                                  aagattetgaagttegaegaggaegeegtegegeeettgagegeggegtgaaceagetg
                                                                                ctgcgcaacgtcgccgccggcctccccggccgcctgaagaagggcatcgacgccgcc
                                                                                                                                                                                          gccgacaccgtcaaggtgaccatcggccccaagggccgcaacgtcgtcatcgacaagaag
                                                                                                                                                                                                                                                                                                                                       18;
                                                                                                                                                                                                                                                                                                                                                    also vectors, trans
                                                                                                                                                                                                                                                                                                                                                                                                               INST
                                                                                                                                                                                                                                                                                                                                                                                                 ָט
                                                                                                                                                                                                                                                                                                                                      Fig
                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                 Guglielmi
                                                                                                                                                                                                                                                                                                                                                                                                               PASTEUR.
                                                                                                                                                                                                                                                                                 BP;
                                                                                                                                                                                                                                                                                                                                      8; 50pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                          91WO-FR00701
                                                                                                                                                                                                                                                                                                                                                                                                                            90FR-0011186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /*tag=
/note=
                                                                                                                                                                                                                                                                                 287 A;
                                                                                                                                                                                                                                                      45.9%;
                                                                                                                                                                                                                                                                                                                                      French.
                                                                                                                                                                                                                                                                                                                                                                                                 G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "groEL-1 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                 590
                                                                                                                                                                                                                                                                                                                                                     albus
                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                              Score 741.6; I
Pred. No. 1.5e
0; Mismatches
                                                                                                                                                                                                                                                                                 c;
                                                                                                                                                                                                                                                                                 539
                                                                                                                                                                                                                                                                                 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 encoding
                                                                                                                                                                                                                                                                                 204
                                                                                                                                                                                                                                                       DB 13;
                                                                                                                                                                                                                                                                                 ;;
                                                                                                                                                                                                                                                 504;
                                                                                                                                                                                                                                                                                 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HSP18'
                                                                                                                                                                                                                                                                                 other;
                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                   actual
                                                                                                                                                                                                                                                                                                            translation
                                                                                                                                                                                                                                                              1620;
                                                                                                                                                                                                                                                 12;
                                                                                                                                                                                                                                                                                                                         which
                                                                                                                                                                                                                                               Gaps
546
             543
                          486
                                        483
                                                     426
                                                                   423
                                                                                366
                                                                                              363
                                                                                                           306
                                                                                                                        303
                                                                                                                                      246
                                                                                                                                                  243
                                                                                                                                                                186
                                                                                                                                                                                                       123
                                                                                                                                                                                                                     66
                                                                                                                                                                                                                                  63
                                                                                                                                                                                                                                                 ω
--
       В
                 Qy
                                 Ър
                                           Ωy
                                                            Ъ
                                                                        Qy
                                                                                       Dр
                                                                                                 Qγ
                                                                                                                 В
                                                                                                                            Qy
                                                                                                                                           ₽
                                                                                                                                                       Qy
                                                                                                                                                                      В
                                                                                                                                                                                  QΥ
                                                                                                                                                                                                В
                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                рь
                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                         Д
                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                            1441
                                                                                       1381
                                                                                                                  1321
                                                                                                                              1318
                                                                                                                                                         1258
                                                                                                                                                                      1207
                                                                                                                                                                                    1198
                                                                                                                                                                                                  1147
                                                                                                                                                                                                               1138
                                                                                                                                                                                                                            1087
                                                                         1438
                                                                                                                                            1264
                                                                                                                                                                                                                                          1078
                                                                                                                                                                                                                                                       1027
                                                                                                                                                                                                                                                                    1018
                                                                                                                                                                                                                                                                                 967
                                                                                                                                                                                                                                                                                                           907
                                                                                                                                                                                                                                                                                               958
                                                                                                                                                                                                                                                                                                                         898
                                                                                                                                                                                                                                                                                                                                      847
                                                                                                                                                                                                                                                                                                                                                                 787
                                                                                                                                                                                                                                                                                                                                                                                           727
                                                                                                                                                                                                                                                                                                                                                                                                        724
                                                                                                                                                                                                                                                                                                                                                                                                                     667
                                                                                                                                                                                                                                                                                                                                                                                                                                   664
                                                                                                                                                                                                                                                                                                                                                                                                                                                607
```

```
Qy
gtggtggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc
                                                                                                                                                               aacaccctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgact
                                                                                                                                                                                                                                       gacggctcggtggtggtcaacaaggtcagcggggctacccgccggggcatgggctgaacgtg
                                                                                                                                                                                                                                                                                                            gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                                                                                                                                                                                                                                                                                                                  gcccgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaagtcctcggtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                gcggccaccgaggtcgagctgaaggagcgcaagcaccgtctggaggacgccatctccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggtcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gagaagctccaggagcgcctcgccaagctggccggcggcgtctgcgtgatccgcgtcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gaaaagcttggcgagcgggctggccaaactggccggcggggttgctgtcatcaaggtgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcggattgggatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gtggtcaacaagatccgcggcacgttcaacgccgtcgccgtcaaggcgcccggcttcggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ggctccaagccgctgctgatcatcgccgaggacgtcgagggcgaggccctgtcgaccctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggcaagatcggttcgatccaggacctgctgccgctgctggagaaggtcatccaggcgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gtcgacctggacttcaccgagggcatggccttcgacaagggctacctgtccccgtacatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                            gccaccggcgagtacggcgacctggtcaaggccggcgtcatcgacccggtcaaggtcacc
                                                                                                                                                                                                                   gagggctacgtcatcaccaccaaggtggcggagctcgacaagggccagggcttcaacgcg
                                                                                                                                                                                                                                                                                         gcggtcgtccgccgccgccgtcgagccgctgcgctggatcgccgagaacgccggcctc
                                                                                                                                                                                                                                                                                                                                                            gccgtcaaggtcctggacgacaacctcggc---cgcaccggcgacgaggccaccggtgtc
                                                                    cgctccgccctggagaacgcggcctccatcgcctccctgctcctgacgaccgagaccctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -aagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctg
   1602
                                                                                                                                                                                   1497
                                                                                                                                                                                                                                                    1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         666
                                                                                                             1557
                                                                                                                                                                                                                                                                                           1380
                                                                                                                                                                                                                                                                                                                                                               1320
                                                                                                                                                                                                                                                                                                                                                                                                 1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           846
                                                                                                                                                1500
                                                                                                                                                                                                                                                                                                                                                                                                                                    1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   777
```

```
RESULT
N80222
ID N8
AC N8
AC N8
CONT 19
XX AC N8
XX M3
XX
                                                                            δ
                                                                                                                                  밁
                                                                                                                                                                      δÃ
                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCCCXXXXIII
  δõ
                                             망
                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 1049; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The gene was isolated by probing a lambda gtl1 expression library M.tuberculosis DNA with monoclonal antibodies directed against M.tuberculosis-specific antigens. The 19kD, 71kD and the 65kD prot and genes are claimed, and so is a vaccine comprising DNA encoding M.tuberculosis protein in a recombinant vaccine vector. P80216 is encoded on the complementary strand.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Genes encoding Mycobacterium tuberculosis protein antigens - useful for developing reagents for diagnosis, prevention and treatment of tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 12; Fig 8; 82pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1988-235175/33.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-FEB-1988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO8805823-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       N80222;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N80222 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   02-FEB-1987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11-AUG-1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            19-MAR-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (WHIT-) WHITEHEAD INST BIOM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacterium
    243
                                                                                                                                                                             123
                                                                                                                                                                                                                        317
                                                                                                                                                                                                                                                                                                             257
                                                                                       183
                                                                                                                                                                                                                                                                63
                                                                                                                                                                                                                                                                                                                                                   w
                                                                   agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                              gtggggtgccccacgatcaccaacgatggtgtccatcgccaaggagatcgagctgga
                                                                                                                                                      gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                            ggccgacaccgtgcgggtgacgctggggcggcgggcggcatgtggtgctggccaaggc 122
                                                                                                                                                                                                                                                                                                                               caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                                                                                                                                                                                     cgccgatgcggtaaaggtgacattgggccccaagggccgcaacgtcgtcctggaaaagaa
                                                                                                                                                                                                                                                                                                         caagacaattgcgtacgacgaagaggcccgtcgcggcctcgagcggggcttgaacgccct
  tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                          ggatccgtacgagaagatcggcgccgagctggtcaaagaggtagccaagaagaccgatga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P80215,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first
                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Young
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BP; 757 A; 1373 C; 1512 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   87US-0010007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            88WO-US00281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement
/*tag= b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
192..1874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Зb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          entry)
                                                                                                                                                                                                                                                                                                                                                                                                                  44.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Shinnick
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ผ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (2398..4101)
                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                            Score 711.4; DB 9;
Pred. No. 4.2e-120;
0; Mismatches 531;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ×
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA contg.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        738 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 encoding
                                                                                                                                                                                                                                                                                                                                                                                              9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    65
                                                                                                                                  436
                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                             316
                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of
                                                                                                                                                                                                                                                                                                                                                                                              ۲
                      δÃ
                                                                                                         QY
                                                                                                                                                    В
                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                        1323
                                                                                                                                                                                                                                                                                       1143
                                                                                                                                                                                                                                                                                                                                 1337
                                                                                                                                                                                                                                                                                                                                                                                                                     1277
                                                                                                                                                                                                                                              1397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1157
                                                                   1517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1217
                                                                                                                                                                                                                                                                                                                                                                                                                                                             1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       303
gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agcgatgaacaaggtcggccacgacagcgtggtcagcgctcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgt
                                                                                                                                                                           ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                          caccgaggtcgaactcaaggagcgcaagcaccgcatcgaggatgcggttcgcaatgccaa
                                                                                                                                                                                                                                                                  caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                             gctgcaggagcggctggccaagctggccggtggtgtcgcggtcatcaaggccggtgccgc
                                                                                                                                                                                                                                                                                                                                                   acgagtggcccagatccgccaggagatcgagaacagcgactccgactacgaccgtgagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                         ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggtcaccaaggacgagaccaccatcgtcgagggcgccggtgacaccgacgccatcgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ggtcggcctgacgctggagaacgccgacctgtcgctgctaggcaaggcccgcaaggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    caacgcgattcgcaagacgttgaaagcggtcgcggtccaaggggccgtacttcggtgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         taagccactactgatcgtggctgaagacgtggaaggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ctccaaggtgtccactgtcaaggatctgctgccgctgctcgagaaggtcatcggagccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gctgcagctcgagctcaccgagggtatgcggttcgacaagggctacatctcggggtactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggcgatggacaaggtgggcaacgagggcgtcatcaccgtcgaggagtccaacacctttgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gattgcggccaccgcagcgatttcggcgggtgaccagtccatcggtgacctgatcgccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              catcgcgcaggtggcgacggtgtcctcgcgcgagcgagcagatcggtgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgccgacgcggtattcgaggcgtgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgtcgccggtgacggcaccacgacggccaccgtgctggccaggcgttggttcgcgaggg
                                                                                                                                                      ggccgccgtcgaggagggcatcgtcgccggtgggggtgtgacgctgttgcaagcggcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ccgcaaggcgatgctgcaggatatggccattctcaccggtggtcaggtgatcagcgaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  caacaagatccgcggcaccttcaagtcggtggcggtcaaggctcccggcttcggcgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                taagccgctgctgatcatcgccgaggacgtcgagggcgaggcgctgtccaccctggtcgt 1036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgtggagaaggtcaccgagaccctgctcaagggcgccaaggaggtcgagaccaaggagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgtgaccgacccggagcgtcaggaggcggtcctggaggacccctacatcctgctggtcag
                                                               -gaccctggacgagctgaagctcgaaggcgacgaggcgaccggcgccaacat
```

1082

1396

1516

1022

1216

1156

1096

782

722

856 602 796

482 676

1;

```
PR XXX PR XXX PR XXX PR XXX PR XXX PR DR XX P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            맑
An isolated DNA molecule that consists essentially of the nucleotide sequence that corresponds to the sequence represented by position 3950 about 2390 and from position 3948 through position 2398 of N81768 is claimed. Also claimed is a peptide sequence that consists of a 5-40 AA residue sequence that corresponds to a sequence of the 540 AA residue protein (p81351) or the 517 AA residue protein (p81868) coded for by th DNA sequence. The proteins can be used for determining previous
                                                                                                                                                                                                                     Recombinant mycobacterial peptide(s) - used in assays for diagnosis of infection, vaccines and for producing antibodies
                                                                                                                                                                                                                                                                                                                  P-PSDB;
                                                                                                                                                                                                                                                                                                                                            WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                               Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          24-FEB-1988;
06-FEB-1987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25-FEB-1988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N81768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1568
                                                                                                                                                                                                                                                                                                                                                                                                                              (SCRI-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WO8806591-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29-DEC-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N81768;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1808
                                                                                                                                                                                                                                                                                                                1988-271136/38.
DB; P81351, P81868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99C99T9TL9aac9c9tCatc99Tt9ccc99at99Tactcaccacc9agac99tc9tg9t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgacaagccggaaaaggagaaggcttccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgacaagccggccaaggcagaagatcacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggcgctgcagaatgcggcgtccatcgcggggctgttcctgaccaccgaggccgtcgttgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggttgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gggcgtggtggccgagaaggtgcgcaacctgccggctggccacggactgaacgctcagac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ctcggtggtggtcaacaaggtcagcggagctaccccgccgggcatgggctgaacgtgaacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cggtgtctacgaggatctgctcgctgccggcgttgctgacccggtcaaggtgacccgttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgtgaaggtggcgctggaggccccgctgaagcagatcgccttcaactccgggctggagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard;
                                                                                                                                                                                                                                                                                                                                                                             T,
                                                                                                                                                                                                                                                                                                                                                                                                                              SCRIPPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     assay;
                                                                                                                                                                               Fig
                                                                                                                                                                                                                                                                                                                                                                                 Houghten
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tuberculos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          88US-0159667
87US-0019529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            88WO-US00598
                                                                                                                                                                                                                                                                                                                                                                                                                                CLINIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /*tag= b
/label=517
                                                                                                                                                                                 2a-2d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note-"P81351
complement (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="P81868"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /label=540 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bovis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            . 187
                                                                                                                                                                                                                                                                                                                                                                                    ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4260
                                                                                                                                                                          116pp;
                                                                                                                                                                                                                                                                                                                                                                                                                              e٦
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (3948..2395)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A protein
1"
                                                                                                                                                                             English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ds
                                                                                                                                                                                                                                                 for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                              producing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1687
                                                                                                              ť
```

```
Qy
                      VΩ
                                                    DЪ
                                                                         δÃ
                                                                                                                                                           밁
                                                                                                                                                                              Qy
                                                                                                                                                                                                              В
                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                                                                                                                           뫄
                                                                                                                                                                                                                                                                                                                                                                                               ΛÕ
                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
    밁
                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SSXCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 1048
    1157
                                                                                                         1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         immunological for producing
                                                                                                                                                                                                                                                                                                                                                                                                                                 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           317
                                                                                                                                                                                                                                                                                                                        797
                                                                                                                                                                                                                                                                                                                                                 543
                                                                                                                                                                                                                                                                                                                                                                             737
                                                                                                                                                                                                                                                                                                                                                                                                       483
                                                                                                                                                                                                                                                                                                                                                                                                                                                         423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      w
                                                                                                                                                                                                                                                                                                                                                                                        agcgatgaacaaggtcggccacgacagcgtggtcaagcgtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cal Similarity 66.0
1048; Conservative
ggtcggcctgacgctggagaacgccgacctgtcgctgctaggcaaggcccgcaaggtcgt
               cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                 caacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
                                                                                                                                                                         taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                            agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                   caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                             catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cctgaggctagtggccgccggcgtcaacccggtcggcgtcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agatccgtttgaagacttgggcgcccagctggtgaagtcggtggcgccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggccgacaccgtgcgggtgacgctggggcggcgggcggcatgtggtgtgtggccaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            caagacaattgcgtacgacgaagaggcccgtcgcggcctcgagcggggcttgaacgccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                    ccgcaaggcgatgctgcaggatatggccattctcaccggtggtcaggtgatcagcgaaga
                                                                                                      caacaagatccgcggcaccttcaagtcggtggcggtcaaggctcccggcttcggcgaccg
                                                                                                                                                          taagccgctgctgatcatcgccgaggacgtcgagggcgaggcgctgtccaccctggtcgt
                                                                                                                                                                                                              ctccaaggtgtccactgtcaaggatctgctgccgctgctcgagaaggtcatcggagccgg
                                                                                                                                                                                                                                                                  cgtgaccgacccggagcgtcaggaggtcctggaggacccctacatcctgctggtcag
                                                                                                                                                                                                                                                                                                                       gctgcagctcgagctcaccgagggtatgcggttcgacaagggctacatctcggggtactt
                                                                                                                                                                                                                                                                                                                                                                          ggcgatggacaaggtgggcaacgagggcgtcatcaccgtcgaggagtccaacacctttgg
                                                                                                                                                                                                                                                                                                                                                                                                                               gattgcggccaccgcagcgatttcggcgggtgaccagtccatcggtgacctgatcgccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgtggagaaggtcaccgagaccctgctcaagggcgccaaggaggtcgagaccaaggagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgtcgccggtgacggcaccacggcgccaccgtgctggcccaggcgttggttcgcgaggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggatccgtacgagaagatcggcgccgagctggtcaaagaggtagccaagaagaccgatga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gtggggtgcccccacgatcaccaacgatggtgtgtccatcgccaaggagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cctgcgcaacgtcgcggccggccaacccgctcggtctcaaacgcggcatcgaaaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgccgatgcggtaaaggtgacattgggccccaagggccgcaacgtcgtcctggaaaagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a vaccine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             43.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         mammal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 709.8; DB 9;
Pred. No. 8.1e-120;
0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       M.tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Η.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       or,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M.bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                           962
                                                                                                         1096
                                                                                                                                                            1036
                                                                                                                                                                                                                976
                                                                                                                                                                                                                                                                     916
                                                                                                                                                                                                                                                                                                                                                 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                         482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     436
                                                                                                                                  842
                                                                                                                                                                                       782
                                                                                                                                                                                                                                          722
                                                                                                                                                                                                                                                                                            662
                                                                                                                                                                                                                                                                                                                       856
                                                                                                                                                                                                                                                                                                                                                                           796
                                                                                                                                                                                                                                                                                                                                                                                                    542
                                                                                                                                                                                                                                                                                                                                                                                                                                736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   676
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302
```

```
PR XXX
                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                          V05708 standard;
                                                                                                                                                                                                                                                                                                                                                                                             1808
                                                                                                                                                                                                                                                                                                                                                                                                                       1563
                                                                                                                                                                                                                                                                                                                                                                                                                                                  1748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1217
03-JUN-1997;
                                                      11-DEC-1997.
                                                                                W09746253-A2
                                                                                                                                                                           Mycobacterium
                                                                                                                                                                                                      gene
                                                                                                                                                                                                                 Heat shock protein; Mt Hsp65; autoimmune disease; immunotherapy;
                                                                                                                                                                                                                                                                                                  V05708
                           03-JUN-1997;
                                                                                                                                                                                                                                           Mycobacterium tuberculosis 65
                                                                                                                                                                                                                                                                                                                                                     5
                                                                                                                                                                                                                                                                                                                                                                                                         cgacaagccggccaaggcagaagatcacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg 1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgt 1322
                                                                                                                                                                                                    therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgtgaaggtggcgctggaggccccgctgaagcagatcgccttcaactccgggctggagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggccgccgtcgaggagggcatcgtcgccggtgggggtgtgacgctgttgcaagcggcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggt 1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccgaa
                                                                                                                                                                                                                                                                                                                                                                                           cgacaagccggaaaaggagaaggcttccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                ggcgctgcagaatgcggcgtccatcgcggggctgttcctgaccaccgaggccgtcgttgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cggtgtctacgaggatctgctcgctgccggcgttgctgacccggtcaaggtgacccgttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gggcgtggtggccgagaaggtgcgcaacctgccggctggccacggactgaacgctcagac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      caccgaggtcgaactcaaggagcgcaagcaccgcatcgaggatgcggttcgcaatgccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gctgcaggagcggctggccaagctggccggtggtgtcgcggtgatcaaggccggtgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acgagtggcccagatccgccaggagatcgagaacagcgactccgactacgaccgtgagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcgggatcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggtcaccaaggacgagaccaccatcgtcgagggcgccggtgacaccgacgccatcgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa 1022
                                                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                           tuberculosis
                                                                                                                                                                                                    rheumatoid arthritis; multiple
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -gaccctggacgagctgaagctcgaaggcgacgaggcgaccggcgccaacat
 97US-0019100
                          97WO-US09427
                                                                                                                                    Location/Qualifiers 252..1874
                                                                                                          /product=
                                                                                                                      /*tag=
                                                                                                                                                                                                                                                                                                                           DNA;
                                                                                                                                                                                                                                                                                                                           4380
                                                                                                          65 kDa heat
                                                                                                                                                                                                                                          kDa heat shock protein gene
                                                                                                                                                                                                                                                                                                                                                                                             1836
                                                                                                                                                                                                                                                                                                                                                                                                                       1591
                                                                                                          shock protein
                                                                                                                                                                                                      sclerosis; ds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1456
                                                                                                                                                                                                                                                                                                                                                                                                                                                1807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1082
```

```
밁
                                  Ş,
                                                                            밁
                                                                                                            Ş
                                                                                                                                                В
                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CC a mammal comprises: (a) providing a particle coated with an antigen CC against which an immune response is mounted in the autoimmune CC disease; (b) delivering the particle into the recipient cell of the CC mammal; and (c) repeating step (b) until either a reduction in a CC cytotoxic immune response or a desensitizing immune response is CC induced in the mammal. Alternatively, step (a) comprises providing CC anucleic acid construct comprising a coding sequence for the CC antigen, operably linked to control elements such that the coding CC antigen, operably linked to control elements such that the coding CC sequence can be transcribed and translated in a recipient cell, and CC feelivering the construct to the recipient cell using a gene gun. CC The antigen of step (a) is selected from collagen, Mt Hsp65.

CC myelin basic protein, myelin oligodendrocyte glycoprotein, CC proteoilpid protein, and epitopes thereof. These antigens mitigate CC cytotoxic responses and elicit antigen desensitisation. The method CC is used especially for treating rheumatoid arthritis or multiple CC sclerosis. It represents a novel use for the known Mt Hsp65 gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 1048; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WPI; 19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This DNA sequence encodes the 65 kDa heat shock protein (see M44702), designated Mt Hsp65, of Mycobacterium tuberculosis. The protein cross-reacts with a component of articular cartilage, humbered, that is up-regulated in the joints of arthritic patients. Claimed method for treating or preventing an autoimmune disease claimed method for treating or preventing an autoimmune disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Treatment of autoimmune diseases - by administering autoantigen-coated particles or autoantigen-encoding nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Example 2; Page 55-59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (AURA-) AURAGEN INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   03-JUN-1996;
                                                                                                                                                                                                                         437
   617
                                    363
                                                                            557
                                                                                                              303
                                                                                                                                                  497
                                                                                                                                                                                     243
                                                                                                                                                                                                                                                             183
                                                                                                                                                                                                                                                                                                 377
                                                                                                                                                                                                                                                                                                                                      123
                                                                                                                                                                                                                                                                                                                                                                        317
                                                                                                                                                                                                                                                                                                                                                                                                                                                 257
                                                                                                                                                                                                                                                                                                                                                                                                            63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                                                           cctgaggctagtggccgccggctcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                  tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                            agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                      cgccgatgcggtaaaggtgacattgggccccaagggccgcaacgtcgtcctggaaaagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1998-041892/04
DB; W44702.
                      cgccgacgcggtattcgaggcgtgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                   gtttggcggacccacggttaccaacgacggcgtcacggtggcacgttgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                         ggccgacaccgtgcgggtgacgctggggccgcggggccggcggcatgtggtgtggtctggccaaggc 122
                                                                                                                                                                                                                                                                                                                                                                                                                                               caagacaattgcgtacgacgaagaggcccgtcgcggcctcgagcggggcttgaacgccct 316
                                                                                                                                                cytcyccygtyacyycaccacyacygccaccytyctyycccayycyttyyttcycyayyy
                                                                                                                                                                                                                       ggatccgtacgagaagatcggcgccgagctggtcaaagaggtagccaagaagaccgatga
                                                                                                                                                                                                                                                                                                gtggggtgcccccacgatcaccaacgatggtgtgtccatcgccaaggagatcgagctgga
cgtggagaaggtcaccgagaccctgctcaagggcgccaaggaggtcgagaccaaggagca
                                                                        cctgcgcaacgtcgcggccggccaacccgctcggtctcaaacgcggcatcgaaaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Prayaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96US-0019100.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        43.9%;
66.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Α.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      72pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ramshaw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 709.8; DB 19; Pred. No. 8.1e-120; 0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 4380;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Į,
                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                 436
                                                                                                                                                                                                                                                                                                                                                                        376
                                        422
                                                                                                                362
                                                                                                                                                                                                                           496
                                                                                                                                                                                                                                                             242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                            616
                                                                                                                                                                                       302
```

1,

QΥ

423

catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga

```
В
                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                망
                                                                                                                                                                           В
                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                    1503
                                                                                                                                                                                                                                                                                                            1457
                                                                                                                                                                                                                                                                                                                                                                        1397
                                                                                                                                                                                                                                                                                                                                                                                                      1143
                                                                                                                                                                                                                                                                                                                                                                                                                                      1337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1217
                                                                                                                                                                             1568
                                                                                                                                                                                                             1323
                                                                                                                                                                                                                                             1517
                                                                                                                                                                                                                                                                           1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1037
                                                  1688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       677
caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                   cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggttgactaggtc
                                                                                                                             ctcggtggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtgaacac
                                                                                                                                                                                                        gttctccgaagcccttgccgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                        caaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgt
                                                                                                                                                                                                                                                                                                                        99ccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                     caccgaggtcgaactcaaggagcgcaagcaccgcatcgaggatgcggttcgcaatgccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                  gctgcaggagcggctggccaagctggccggtggtgtcgcggtgatcaaggccggtgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggtcaccaaggacgagaccaccatcgtcgagggggcgcggtgacaccgacgccatcgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggtcggcctgacgctggagaacgccgacctgtcgctacgcaaggcaaggcccgcaaggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           caacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         taagccactactgatcgtggctgaagacgttggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
                                              cggtgtctacgaggatctgctcgctgccggcgttgctgacccggtcaaggtgacccgttc
                                                                                                            999cgtggtggccgagaaggtgcgcaacctgccggctggccacggactgaacgctcagac
                                                                                                                                                                          cgtgaaggtggcgctggaggccccgctgaagcagatcgccttcaactccgggctggagcc
                                                                                                                                                                                                                                                                                                       9gccgccgtcgaggagggcatcgtcgccggtgggggtgtgacgctgttgcaagcggcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    acgagtggcccagatccgccaggagatcgagaacagcgactccgactacgaccgtgagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccgcaaggcgatgctgcaggatatggccattctcaccggtggtcaggtgatcagcgaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           caacaagatccgcggcaccttcaagtcggtggcggtcaaggctcccggcttcggcgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        taagccgctgctgatcatcgccgaggacgtcgagggcgaggcgctgtccaccctggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctccaaggtgtccactgtcaaggatctgctgccgctgctcgagaaggtcatcggagccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgtgaccgacccggagcgtcaggaggccgttctggaggacccctacatcctgctggtcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gctgcagctcgagctcaccgagggtatgcggttcgacaagggctacatctcgggggtactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ggcgatggacaaggtgggcaacgaggcgtcatcaccgtcgaggagtccaacacctttgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gattgcggccaccgcagcgatttcggcgggtgaccagtccatcggtgacctgatcgccga
                                                                                                                                                                                                                                       -gaccctggacgagctgaagctcgaaggcgacgaggcgaccggcgccaacat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      =
-
=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      =
=
=
=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1082
                                                                                                                                                                                                                                                                         1322
                                                                                                                                                                                                                                                                                                                                                                                                    1202
                                                                                                                                                                                                                                                                                                                                                                                                                                      1396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1036
                  1562
                                                1747
                                                                                1502
                                                                                                              1687
                                                                                                                                            1442
                                                                                                                                                                           1627
                                                                                                                                                                                                                                           1567
                                                                                                                                                                                                                                                                                                         1516
                                                                                                                                                                                                                                                                                                                                        1262
                                                                                                                                                                                                                                                                                                                                                                      1456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    736
```

Š

δ

δ

δÃ 밁 δõ

õ

Query Match 42.0 Best Local Similarity 65.0 Matches 1035; Conservative

. 68;

Score 685.6; 1 Pred. No. 1.8e 0; Mismatches

.8e-115;

Indels Length

9;

Gaps

2

DB

20;

1626

No. 1.

0;

δô

δÃ

õ

```
RESULT Z11371 ID Z11371 ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                            The invention provides heat-killed Mycobacterium vaccae, or recombinant M. vaccae proteins. The M. vaccae proteins may be employed to activate T cells and natural killer cells, to stimulate the production of Cytokines, to enhance the expression of co-stimulatory molecules on dendritic cells and monocytes, and to enhance dendritic cell maturation and function. The proteins can be expressed by standard recombinant methodology. Pharmaceutical compositions comprising the proteins or nucleic acid sequences encoding the proteins can be used for the treatment, prevention, and detection of disorders including infectious diseases, immune disorders and cancer. In particular, the compounds and methods are used for treatment of diseases of the respiratory system, such as mycobacterial infections, asthma, altergies, tuberculosis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                04 - DEC - 1998;
23 - DEC - 1997;
23 - DEC - 1997;
23 - DEC - 1997;
11 - JUN - 1998;
17 - SEP - 1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium vaccae protein; antigen; T cell activation; cytokine; dendritic cell maturation; infectious disease; immune disorder; can respiratory system; mycobacterial infection; allergy; tuberculosis; leprosy; sarcoidosis; lung cancer; asthma; skin disorder; psoriasis; dermatitis; eczema; alopecia areata; skin cancer; basal carcinoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1748
                                                                          leprosy, sarcoidosis and lung cancers, and disorders of the skin such psoriasis, atopic dermatitis, eczema, allergic contact dermatitis, alopecia areata, and skin cancers such as basal carcinoma, squamous ce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Enhancing immune response to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              W09932634-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 squamous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Z11371
  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Prestidge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nucleotide sequence of M. vaccae antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (GENE-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1999-430163/36
DB; Y14909.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgacaagccggaaaaggagaaggcttccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgacaagccggccaaggcagaagatcacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggcgctgcagaatgcggcgtccatcgcggggctgttcctgaccaccgaggccgtcgttgc 1807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ω
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Page
  1626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
     ₽₽;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           212-213;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 carcinoma; melanoma; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98US-0205426.
97US-0996624.
97US-0997080.
97US-0997362.
98US-0095855.
98US-0156181.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  vaccae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Skinner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98WO-NZ00189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RES &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA;
  302
  Α;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      243pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ¥,
  537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Tan
  ç;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          an antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LTD.
  552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ψ,
  G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Visser
  235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GV-27
  Т;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ES,
  0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Watson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           J,
                                                                            squamous cell
```

```
1026
                                    1023
                                                                     966
                                                                                                                                  906
                                                                                                                                                                903
                                                                                                                                                                                                 846
                                                                                                                                                                                                                                                                                                                                                                                         999
                                                                                                                                                                                                                                                                                                                                                                                                                        663
                                                                                                                                                                                                                                                                                                                                                                                                                                                        909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    486
                                                                                                                                                                                                                                                              786
                                                                                                                                                                                                                                                                                            783
                                                                                                                                                                                                                                                                                                                            726
                                                                                                                                                                                                                                                                                                                                                         723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            w
                  ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcgggatcgggaaaa
                                                                                 ggtcagcaaggacgacacggtcattgtcgacggcggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                cgccggcattgtgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                ccgtaaggcgttccttgaggacctggcggtggtgacgggttggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                             caacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
                                                                                                                                                                                                                                                                                                                       agtcgggctgtccctggagaccgccgacgtctcgctgctgggccaggcccgcaaggtcgt
                                                                                                                                                                                                                                                                                                                                                                                       ctccaaggtgtcgaccgtcaaggatctgctcccgctgctggagaaggtcatccaggccgg
                                                                                                                                                                                                                                                                                                                                                                                                        agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 agcgatgaacaaggtcggccacgacagcgtggtcagcgttcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgccgacgcggtattcgaggcgtgctggcatcggcacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ccgggtggctcagatccgcgccgagatcgagaacagcgactccgactacgaccgcgagaa
                                                                   cytcaccaaggacgagaccacca:
                                                                                                                                                                                              ccgcaaggcgatgctgcaggacatggccatcctcaccggtggtcaggtcgtcagcgaaag
                                                                                                                                                                                                                                                           caacaagatccgcggcaccttcaagtccgtcgccgtcaaggctccgggcttcggtgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgtgaccgacgccgagcgccaggaagccgtcctggaggatccctacatcctgctggtcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggccatggacaaggtcggcaacgagggtgtcatcaccgtcgaggagtcgaacaccttcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gatttctgccaccgcggcgatttccgccggcgacacccagatcggcgagctcatcgccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggttgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgtcgaggctgtcacccagtcgctgctgaagtcggccaaggaggtcgagaccaaggagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cctgcgcaacgtcgcagccggcccaacccgctcggcctcaagcgtggcatcgagaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tgttgccggtgacggcaccaccgccaccgccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggacccgtacgagaagatcggcgctgagctggtcaaagaggtcgccaagaagaccgacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agatccgtttgaagacttgggcgccagctggtgaagtcggtggcgccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gtggggcgcccccacgatcaccaacgatggtgtgtccatcgccaaggagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caagctgatcgaatacgaagaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caagacaattgcgtatgacgaagaggcccgccgtggcctcgagcggggcctcaacgccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              542
                                                                                                                                                                                                                                                                                           842
                                                                                                                                                                                                                                                           845
                                                                                                                                                                                                                                                                                                                          785
                                                                                                                                                                                                                                                                                                                                                         782
                                                                                                                                                                                                                                                                                                                                                                                                                       722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
```

20 Db Db Db Db Db Db Db Db

8 8

밁

Qy Db

```
RESULT
V34608
                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
       Hiyama
Visser
                                                                                                                                                                                             Mycobacterium vaccae; antigen; therapy; prevention; cytokine production; M. avium; M. tuberculosis; immune response enhancer; cell proliferation; mycobacteria infection; vaccine; cancer; ss.
                                                                          28-AUG-1997;
                                                                                           05-MAR-1998
                                                                                                                                                      CDS
                                                                                                                                                                                                                                3
                                                                                                                                                                                                                                                                 V34608;
                                                                                                                                                                                                                                                                                                                            1557
                                                                                                                                                                                                                                                                                                                                            1563
                                                                                                                                                                                                                                                                                                                                                             1497
                                                                                                                                                                                                                                                                                                                                                                               1503
                                                                                                                                                                                                                                                                                                                                                                                              1437
                                                                                                                                                                                                                                                                                                                                                                                                               1443
                                                                                                                                                                                                                                                                                                                                                                                                                                1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                1383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1083
                                                 12-JUN-1997;
29-AUG-1996;
                                                                                                           WO9808542-A2
                                                                                                                                                                              Mycobacterium
                                                                                                                                                                                                                                                 25-AUG-1998
                                                                                                                                                                                                                                                                                 V34608
                                (GENE-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                               t---
                                                                                                                                                                                                                                                                                                                                     cgacaagccggccaaggc
                                                                                                                                                                                                                                                                                                                                                           cgacaagccggagaaggc
                                                                                                                                                                                                                                                                                                                                                                                                      cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                       ctcggtggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtgaacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caaggcgctgaccgaactgcgtgcgtgcgctgaccggtgacgaggtcctcggtgtcgacgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            caccgacaccgcactcaaggaggcgcaaggaaagcgtcgaggatgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                            cggtgagtacgaggacctgctcaaggccggcgtcgccgacccggtgaaggtcacccgctc
                                                                                                                                                                                                                                                                                                                                                                                                                              cggcgtcgttgccgagaaggtgtccaacctgcccgcgggtcacggcctcaacgccgcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggctgccgtcgaagagggcatcgtcgccggtggcggcgtggctctgctgcagtcggct;cc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   caccgaggtggagctcaaggagcgcaagcaccgcatcgaggacgccgtccgcaacgcgaa
        E (4
                                                                                                                                                                                                                                                                                  standard;
                                GENESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -gcgctggacgacctcggc-----ctgacgggcgacgaggccaccggtgccaacat
                                                                                                                                                                                                                                antigen
                Prestidge
                                                                                                                                                                                                                                                (first
                                                                                                                                                                               vaccae
                                                 97US-0873970.
96US-0705347.
                                                                           97WO-NZ00105
                                RES
                                                                                                                           /*tag= a
/product= "GV-27
/note= "the stop
                                                                                                                                                                                                                                                                                  DNA;
                                                                                                                                                                                                                               GV-27 encoding
                                50
                                                                                                                                                                                                                                                entry)
               RL,
                                DEV
                                                                                                                                                                                                                                                                                  1569
                                CORP
                Scott LM,
                                                                                                                                                                                                                                                                                  ₿P
                                                                                                                             antigen"
codon is
                                                                                                                                                                                                                                DNA.
                Skinner
                                                                                                                             ż
                                                                                                                             not indicated"
                ΜĂ,
               Tan
                ۵,
                                                                                                                                                                                                                                                                                                                                                             1556
                                                                                                                                                                                                                                                                                                                                                                              1562
                                                                                                                                                                                                                                                                                                                                                                                               1496
                                                                                                                                                                                                                                                                                                                                                                                                               1502
                                                                                                                                                                                                                                                                                                                                                                                                                                1436
                                                                                                                                                                                                                                                                                                                                                                                                                                                1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1376
```

```
b
       δÃ
                                                                                                                                                      Qy
                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                              δ
                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                        δô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 1030;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            provides M. vaccae polypeptides that comprise an immunogenic portion of a soluble M. vaccae antigen, or a variant, where the antigen induces an immune response in patients previously exposed to a mycobacterium. Such M. vaccae polypeptides can be used in methods for enhancing non-specific immune response. The methods and products can be used for the detection, treatment and prevention of infectious diseases caused by mycobacteria such as M. vaccae, M. avium or M. tuberculosis. The products also have the ability to induce cell proliferation and cytokine production (e.g. interferon gamma and interleukin-12 production) in T cells, NK cells, B cells, or macrophages. They can be used for enhancing immune responses for use in vaccines or immunotherapy of infectious diseases and cancers.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacterium vaccae polypeptides - used to develop products for use in detection, therapy and prevention of mycobacteria infections or as immune response enhancers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Example
              483
                                                  426
                                                                                       423
                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                           186
                                                                                                                                                                                                                                                                                                                                                                          183
                                                                                                                                                                                                                                                                                                                                                                                                              126
                                                                                                                          366
                                                                                                                                                                                               306
                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                      243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 y Match
Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcgggcatggacaagct
agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
                                                                                                                                                                                                              cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                        agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccccccaagacccaacga
                                                                                                                                                                                                                                                                                                                                                                                                                               gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99ccgacaccgtgcgggtgacgctgggggccgcgcgggcatgtggtgtggccaaggc
                                                gatttctgccaccgcggcgatttccgccggcgacacccagatcggcgagctcatcgccga
                                                                   catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga
                                                                                                                     tgtcgaggctgtcacccagtcgctgctgaagtcggccaaggaggtcgagaccaaggagca
                                                                                                                                           cgccgacgcggtattcgaggcgtgctggctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                           cctgcgcaacgtcgcagccggccaacccgctcggcctcaagcgtggcatcgagaaggc
                                                                                                                                                                                                                                                                cgtcgcgggcgacggcaccaccgccaccgtgctcgctcaggctctggttcgcgaagg
                                                                                                                                                                                                                                                                                 tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                     ggacccgtacgagaagatcggcgctgagctggtcaaagaggtcgccaagaagaccgacga
                                                                                                                                                                                                                                                                                                                                                                                                          gtggggcgcccccacgatcaccaacgatggtgtgtccatcgccaaggagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgcagacgccgtaaaggtgacgttgggcccgaagggtcgcaacgtcgtgctggagaagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    caagacaattgcgtatgacgaagaggcccgccgtggcctcgagcggggcctcaacgccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1998-216926/19
DB; W60144.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6; Page 114; 153pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1569 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    encodes a Mycobacterium vaccae antigen GV-27. The invention M. vaccae polypeptides that comprise an immunogenic portion
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           42.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ۸,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 681.8;
Pred. No. 8.6e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    531 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             681.8; DB
No. 8.6e-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 19;
e-115;
532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Τ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
```

2

122

182

185

245

δõ

546

В

486

δÃ 밁

cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca

RESULT Z11343 ID Z1 XX AC Z1 XX DT Z5 XX

25-OCT-1999

(first entry)

211343

standard;

DNA;

1569

æ

cgtgaccgacgccgagcgccaggaagccgtcctggaggatccctacatcctgctggtcag

caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt ggccatggacaaggtcggcaacgagggtgtcatcaccgtcgaggagtcgaacaccttcgg

485 482 425 422

365

305 302

542

g

```
밁
                         Qy
                                                         В
                                                                                Ωy
                                                                                                                  Ъ
                                                                                                                                          Qy
                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ДĎ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ДD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
  1557
                                                           1497
                                                                                                                   1437
                                                                                                                                              1443
                                                                                                                                                                          1377
                                                                                                                                                                                                                                                                                                                                                                                                      1146
                                                                                       1503
                                                                                                                                                                                                                                                                                        1266
                                                                                                                                                                                                                                                                                                                                                                          1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          726
cgacaagccgg
                                                                     ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggt
                                                                                                                                                                                      gttctccgaagcccttgccgcgccgttgttctggatcgccgcccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                             99ccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                 caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               caacagegattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                        ggcgctgcagaacgcggcgtccatcgcggctctgttcctcaccaccgaggccgtcgtcgc
                                                                                                                                                                                                                                                                                     t---gcgctggacgacctcggc-----ctgacgggcgacgaggccaccggtgccaacat
                                                                                                                                                                                                                                                                                                       caaggcgctgaccgaactgcgtgcgtgccgctgaccgatgtcctcggtgtcgacgt
                                                                                                                                                                                                                                                                                                                                                                                                   caccgaggtggagctcaaggagcgcaagcaccgcatcgaggacgccgtccgcaacgcgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                          gctgcaggagcgcctggccaagctggccggcggtgttgcggtgatcaaggccggagctgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccgggtggctcagatccgcgcgagatcgagaacagcgactccgactacgaccgcgagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 agtcgggctgtccctggagaccgccgacgtctcgctgctgggccaggcccgcaaggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgccggcattgtgctgcgcgaggtggggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                cggtgagtacgaggacctgctcaaggccggcgtcgccgacccggtgaaggtcacccgctc
                                                                                                                              cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggttgactaggtc
                                                                                                                                                                                                                              cgtccgcgtggcgctgtcggctccgctcaagcagatcgccttcaacggcggcctggagcc
                                                                                                                                                                                                                                                                                                                                           ggctgccgtcgaagaggcatcgtcgccggtggcgtggctctgctgcagtcggctcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgtcaccaaggacgagaccaccatcgtcgagggctcgggggattccgatgccatcgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccgcaaggcgatgctgcaggacatggccatcctcaccggtggtcaggtcgtcagcgaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       caagccgctgctgatcatcgccgaggacgtcgagggcgaggccctgtccacgctggtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctccaaggtgtcgaccgtcaaggatctgctcccgctgctggagaaggtcatccaggccgg
                                                                                                                                                                         cggcgtcgttgccgagaaggtgtccaacctgcccgcgggtcacggcctcaacgccgcgac
  1567
                             1573
                                                                                                                                                                                                                                                                                        1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1085
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1022
                                                                                      1562
                                                                                                                  1496
                                                                                                                                              1502
                                                                                                                                                                                                                                1376
                                                                                                                                                                                                                                                            1382
                                                                                                                                                                                                                                                                                                                   1322
                                                                                                                                                                                                                                                                                                                                              1265
                                                                                                                                                                                                                                                                                                                                                                          1262
                                                                                                                                                                                                                                                                                                                                                                                                     1205
                                                                                                                                                                                                                                                                                                                                                                                                                                 1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                725
```

```
Qy
                                                                                                       망
                                                                                                                                  Q
                                                                                                                                                                 망
                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                      20
                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 1030;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    04 - DEC - 1998;
23 - DEC - 1997;
11 - JUN - 1998;
17 - SEP - 1998;
                                                                                                                                                                                                                                                                                                                                            and function. The proteins can be expressed by standard recombinant methodology. Pharmaceutical compositions comprising the proteins or nucleic acid sequences encoding the proteins can be used for the treatment, prevention, and detection of disorders including infectious diseases, immune disorders and cancer. In particular, the compounds and methods are used for treatment of diseases of the respiratory system, such as mycobacterial infections, asthma, allergies, tuberculosis, leprosy, sarcoidosis and lung cancers, and disorders of the skin such as psoriasis, atopic dermatitis, eczema, allergic contact dermatitis, allopecia areata, and skin cancers such as basal carcinoma, squamous cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The invention provides heat-killed Mycobacterium vaccae, or recombinant M. vaccae proteins. The M. vaccae proteins may be employed to activate T cells and natural killer cells, to stimulate the production of cytokines, to enhance the expression of co-stimulatory molecules on dendritic cells and monocytes, and to enhance dendritic cells and monocytes, and to enhance dendritic cells and monocytes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            respiratory system; mycobacterial infection; allergy; tuberculosis; leprosy; sarcoidosis; lung cancer; asthma; skin disorder; psoriasis; dermatitis; eczema; alopecia areata; skin cancer; basal carcinoma;
                                                                                                                                                                                                                                                                                                   Sequence 1569 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 1999-430163/36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Prestidge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               squamous
                                                                                                                                                                                                                                                                                                                               carcinoma and melanoma.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Example 14; Page 188-189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          dendritic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nucleotide
                                              126
                                                                          123
                  183
                                                                                                       66
                                                                                                                                                                                                                            Local Similarity 65.0
les 1030; Conservative
                                                                                                                                   63
                                                                                                                                                                  6
                                                                                                                                                                                              w
                                                                                                                                                                                caagctgatcgaatacgacgaaaccgcgcgcgtcgccatggaggtcggcatggacaagct 62
                                                            gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
agatccgtttgaagacttgggcgccagctggtgaagtcggtggccaccaagaccaacga
                                             <u>gtggggcgccccacgatcaccaacgatggtgtgtccatcgccaaggagatcgagctgga</u>
                                                                                                      cgcagacgccgtaaaggtgacgttgggcccgaagggtcgcaacgtcgtgctggagaagaa
                                                                                                                     ggccgacaccgtgcgggtgacgctggggcgggcgggcatgtggtggtggccaaggc
                                                                                                                                                               caagacaattgcgtatgacgaagaggcccgccgtggcctcgagcggggcctcaacgccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rium vaccae protein; antigen; T cell activati
cell maturation; infectious disease; immune
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    immune
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98US-0205426.
97US-0996624.
97US-0997080.
97US-0997362.
98US-0095855.
98US-0156181.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 carcinoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Skinner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98WO-NZ00189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RES &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    response
                                                                                                                                                                                                                                                                                                   292 A; 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      of
                                                                                                                                                                                                                                          42.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 melanoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      243pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    vaccae antigen
                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Tan P,
                                                                                                                                                                                                                                          Score 681.
Pred. No.
                                                                                                                                                                                                                                                                                                   Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    an antigen
                                                                                                                                                                                                                                                                                                     531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GIT
                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SS
                                                                                                                                                                                                                                                                                                   <u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Visser
                                                                                                                                                                                                                          8.6e-115;
ches 532;
                                                                                                                                                                                                                                                                                                     227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cell activation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GV-27
                                                                                                                                                                                                                                                                                                     Τ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ES,
                                                                                                                                                                                                                                                         DВ
                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                                                                                     other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Watson
                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ion; cytokine;
disorder; can
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ų.
                                                                                                                                                                                                                            9;
                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cancer;
                                                                        182
                                                                                                                                                                 65
                                                                                                                                                                                                                            2
                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
 밁
                       QΥ
                                                                                                                     В
                                                                                                                                              QΥ
                                                                                                                                                                               밁
                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                   дb
                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
 1266
                               1263
                                                            1206
                                                                                        1203
                                                                                                                     1146
                                                                                                                                                   1143
                                                                                                                                                                                1086
                                                                                                                                                                                                              1083
                                                                                                                                                                                                                                          1026
                                                                                                                                                                                                                                                                      1023
                                                                                                                                                                                                                                                                                                     966
                                                                                                                                                                                                                                                                                                                                                             906
                                                                                                                                                                                                                                                                                                                                                                                          903
                                                                                                                                                                                                                                                                                                                                                                                                                      846
                                                                                                                                                                                                                                                                                                                                                                                                                                                    843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           246
 t---
                                                                                                                                                                                                                                                                                                caaggcgctgaccgaactgcgtgcgtgcgtgaccggtgacgaggtcctcggtgtcgacgt 1322
                                                                        ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                   caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccaa
                                                                                                                                                                                              ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcgggattcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                         cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggcctgggcccgacgcgtggt 962
                                                                                                                                                                                                                                                                                                                                                                                                                                    ccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaaccccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                agcgatgaacaaggtcggccacgacagcgtggtcagggtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggttgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgccgacgcggtattcgaggcgctgctggccatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                          ggctgccgtcgaagagggcatcgtcgccggtggcggtggctctgctgcagtcggctcc
                                                                                                                    caccgaggtggagctcaaggagcgcaagcaccgcatcgaggacgccgtccgcaacgcgaa
                                                                                                                                                                             gctgcaggagcgcctggccaagctggccggcggtgttgcggtgatcaaggccggagctgc
                                                                                                                                                                                                                                        ccgggtggctcagatccgcgccgagatcgagaacagcgactccgactacgaccgcgagaa
                                                                                                                                                                                                                                                                                                                                                          agtcgggctgtccctggagaccgccgacgtctcgctgctgggccaggcccgcaaggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                     ccgcaaggcgatgctgcaggacatggccatcctcaccggtggtcaggtcgtcagcgaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caacaagatccgcggcaccttcaagtccgtcgccgtcaaggctccggggcttcggtgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       caagccgctgctgatcatcgccgaggacgtcgagggcgaggccctgtccacgctggtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       taagccactactgatcgtggctgaagacgttggaggggaagcgttggcgacgctggtcgt 782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ctccaaggtgtcgaccgtcaaggatctgctcccgctgctggagaaggtcatccaggccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgtgaccgacgccgagcgccaggaagccgtcctggaggatccctacatcctgctggtcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cctgcagctcgagctcaccgagggtatgcgcttcgacaagggctacatctcgggttactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggccatggacaaggtcggcaacgagggtgtcatcaccgtcgaggagtcgaacaccttcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gatttctgccaccgcggcgatttccgccggcgacacccagatcggcgagctcatcgccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgtcgaggctgtcacccagtcgctgctgaagtcggccaaggaggtcgagaccaaggagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cctgcgcaacgtcgcagccggccaacccgctcggcctcaagcgtggcatcgagaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <u>ggacccgtacgagaagatcggcgctgagctggtcaaagaggtcgccaagaagaccgacga</u>
-gcgctggacgacctcggc----
·ctgacgggcgacgaggccaccggtgccaacat
                                                                                                                       1205
                                                                                                                                                                                1145
                                                                                                                                                                                                                                           1085
                                                                                                                                                                                                                                                                         1082
                                                                                                                                                                                                                                                                                                   1025
                                                                                                                                                                                                                                                                                                                                 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              542
```

665

605

```
RESULT NBOUND ND NBOUND ND NBOUND ND NBOUND NBOUND NBOUND NBOUND NBOUND NBOUND NBOUND NBOUND NBOUND 
The gene was isolated by probing a lambda gtll library of M. leprae DNA with MAbs directed against M. leprae specific antigens. The sequences were determined with a rapid primer extension method. The antigen appears as a doublet on SDS PAGE with mol. wt. 55-65 kD so translation may initiate at the start of either CDS in the feature table, producing two polypeptides. The sequence can be used in the development of highly specific serological tests for screening populations for individuals producing Abs to M. leprae, in the
                                                                                                                                                                                                                                                                                                                                                  {\tt DNA} encoding antigens of {\tt Mycobacterium} leprae - used for producing immuno-determinant protein antigen for prevention, diagnosis and treatment of leprosy.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1988-049978/07
P-PSDB; P80364.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1383
                                                                                                                                                                                                                                                                                       Claim 7; Fig 1; 46pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               misc_RNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Young
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     28-JUL-1987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11-FEB-1989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W08800974-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Leprosy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N80339;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (WHIT-) WHITEHEAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       31-JUL-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10-OCT-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NB0339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgacaagccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgacaagccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggttgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggcgctgcagaacgcggcgtccatcgcggctctgttcctcaccaccgaggccgtcgtcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cggtgagtacgaggacctgctcaaggccggcgtcgccgacccggtgaaggtcacccgctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgtccgcgtggcgctgtcggctccgctcaagcagatcgccttcaaccggcggcctggagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cggcgtcgttgccgagaaggtgtccaacctgcccgcgggtcaccggcctcaacgccgcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Y3178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   insert contg.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 87WO-US01825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       86US-0892095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product=61,856 (
207..1832
/*tag= b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          66..1832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product=56,686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entry]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BIOM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               armadillo;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       leprae 65kD antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dalton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dalton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1376
```

δõ

δÃ

д

δÃ

뫄 δõ B δÃ

В

DЬ

1112

ggtcggtctcacattggagaacaccgatctgtcattgctgggcaaggcccgcaaggtggt

```
δÕ
                                                        29
                                                                                                                                                                                                                                                                                                                                                                                                                     οy
                                   Ъ
                                                                                   Ъ
                                                                                                         Ωy
                                                                                                                                     В
                                                                                                                                                         δÃ
                                                                                                                                                                                      Ъ
                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sox
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 1006; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               development of vaccines
                                                                                     992
                                                                                                                                      932
                                                                                                                                                                                                                                         812
                                                                                                                                                                                                                                                                  603
                                                                                                                                                                                                                                                                                                                   543
                                                                                                                                                                                                                                                                                                                                             692
                                                                                                                                                                                                                                                                                                                                                                                                632
                                                                                                                                                                                                                                                                                                                                                                                                                                                572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       212
                                                                                                             783
                                                                                                                                                              723
                                                                                                                                                                                                                                                                                           752
                                                                                                                                                                                                                                                                                                                                                                     483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3 caagctgatcgaatacgacgacaaccgcgcgtcgcgccatggaggtcggcatggacaagct
taagccactactgatcgtggctgaagacgttggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                         agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                         catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggttgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                            cyccyacycoytattcyayycytyctgycatcyyccacyccygtytccyycaagaccyy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agatccgftttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99ccgacaccgtgcgggtgacgctgggggccgcggccggcatgtggtgctggccaaggc
                                                caacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccg
                                                                                                                                                                                                 agacaagatcagctcgcctcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                     cgttaccgacttcgataaccagcaggcggttgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                      caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                             aattgctgccactgcagcgatttcggcgggtgaccagtcgatcggtgatctgatctgccga
                                                                                                                                                                                                                                                                                                                                                                                                                                              tgtcgataaggtaactgagactctgctcaaggacgctaaggaggtcgaaaccaaggaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgttgccggtgacggcaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggacccgtacgagaagattggcgctgagttggtcaaggaagtcgccaagaagacagatga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtggggtgctcccacgatcaccaacgatggcgtgtccatcgccaaggagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    caagacaattgcgtacgacgaagaggcccgtcgcggcctcgagcggggcttgaacagcct
                                                                                    caacaagateegtggeactttcaagteggtggcggtcaaageteetggetttggtgaceg
                                                                                                                                   caagtcgctgctgatcattgctgaggatgtcgagggtgaggcgttgtctaccctggtcgt
                                                                                                                                                                                      ctccaaagtgtctaccgtcaaggacctgctgccgctgctagagaaggtcatccaggccgg
                                                                                                                                                                                                                                                                                         tctgcagctcgagctcaccgagggaatgcggttcgacaagggctacatttcgggctactt
                                                                                                                                                                                                                                                                                                                                           ggcgatggacaaggttggcaacgagggtgttatcaccgtcgaggaatccaacaccttcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cctacgcaacgtcgcggccggccaacccgctaggtctcaagcgtggcatcgagaaagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgtcgccggtgatggcaccacgacggccaccgtgctggcccaggcattggtcaaagaggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgccgacgcggtaaaggtgacgttgggtccgaaggggcgcaacgtcgttctagagaagaa
                                                                                                                                                                                                                                      cgtcaccgacgccgagcgtcaggaagctgtcctagaggagccctacatccttctggtcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ВP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     724 A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   39.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               and in the assessment of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. 3e-:
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ç;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      e 634.4; DB 9;
No. 3e-106;
ismatches 571;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     T; 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               efficacy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3613;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of treatment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
           962
                                    1111
                                                                                    1051
                                                                                                                                                                                                                                                                                                                                                                                                                      482
                                                                                                                                                                                                                                                                                                                                                                                                                                                631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                             842
                                                                                                                                      991
                                                                                                                                                             782
                                                                                                                                                                                       931
                                                                                                                                                                                                                722
                                                                                                                                                                                                                                         871
                                                                                                                                                                                                                                                                 662
                                                                                                                                                                                                                                                                                          811
                                                                                                                                                                                                                                                                                                                   602
                                                                                                                                                                                                                                                                                                                                            751
                                                                                                                                                                                                                                                                                                                                                                    542
                                                                                                                                                                                                                                                                                                                                                                                              691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122
```

1;

```
RESULT
Q22484
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                        1763
                                                                               10-SEP-1990;
                                                                                                       03-SEP-1991;
                                                                                                                                                                                                                         gro
                                                                                                                                                                                                                                                                                                                                                                             1563
            WPI;
                                  Mazodier P,
                                                                                                                                                                            Streptomyces
                                                                                                                                                                                                  Heat shock protein;
                                                                                                                                                                                                                                                                                             Q22484 standard;
                                                        (INSP ) INST
                                                                                                                              19-MAR-1992
                                                                                                                                                                                                                                                 29-JUL-1992
                                                                                                                                                                                                                                                                                                                    10
                                                                                                                                                                                                                         es el operon with promoter
            1992-114358/14
                                                                                                                                                                                                                                                                                                                                                                                                 cgacaagccggccaaggcagaagatc 1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                     cgacaagccggagaagacggcagctc 1788
                                                                                                                                                                                                                                                                                                                                                                                                                                                            cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ctcggtggtcgaccaaggtcagcgagctacccgccgggcatgggctgaacgtgaacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tgtcaaggtggcgttggaagctccgctcaagcagatcgccttcaattccgggatggagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggccgcggtggaggagggatcgtcgccggcggcggtgtgactctgctacaggctgctcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caccgacaccgcactcaaggagcgcaaggaaagcgtcgagggatgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 actgcaggaacgcctggctaagttggccggtggtgttgcggtgatcaaggccggtgctgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggttggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                cggtgagtacgaggacctgctcaaggccggcgttgccgacccggtgaaggttacacgttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cggcgtggtggccgaaaaggtgcgtaacctttcagtgggtcacggcctgaacgccgccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cactgaggtggagctcaaggagcgcaagcaccgcatcgaggacgcagtccgcaacgccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcgagtggctcagatccgtaccgagatcgagaacagtgactctgactatgaccgcgagaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tatgaccaaggacgaaaccaccatcgtcgagggtgccggtgacaccgacgccatcgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -ggctctggacaagct----gaagctgaccggtgacgaggcgaccggtgccaatat
                                  Guglielmi
                                                         PASTEUR
                                                                                                                                                                                                                                                 (first
                                                                                                       91WO-FR00701
                                                                                                                                                                                                                                                                                             DNA;
                                                                                                                                                                                                   SS
                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                             2167
                                                                                                                                                                                                                          sequence
                                                                                                                                                                                                                                                                                                                                                                                                     1762
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1471
```

```
Ş
                                                                                 맑
                                                                                                          Ş
                                                                                                                                        밁
                                                                                                                                                              Ω
                                                                                                                                                                                            밁
                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                Вр
                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                             рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOXCCCXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The sequer sequence.
                                                                                  1575
                                                                                                                                        1515
                                                                                                                                                                                                                                                1395
                                                                                                                                                                                                                                                                                                     1335
                                                                                                                                                                                                                                                                                                                                                           1275
                                                                                                                                                                                                                                                                                                                                                                                                               1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Recombinant DNA contg. heat inducible promoter and heterologous gene - also vectors, transformed cells and new heat shock proteins of Streptococcus albus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                     604
                                                                                                                                                                                                                                                                                                                                484
                                                                                                                                                                                                                                                                                                                                                                                  424
  838
                                                                                                                                                                                                                                                                                                                                                                                                                                        364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sequence :
ience, See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                                                                                                   gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt 723
                                                                                                                                                                                                                                                               accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aagattctgaagttcgacgaggacgcccgtcgcgcccttgagcgcggcgtgaaccagctg
gaccgccgtaaggcgttccttgaggacctggcggtggtgacgggtggccacgtggtcaac
                          gtggtcaacaagatccgcggcacgttcaacgccgtcgccgtcaaggcgcccggcttcggt
                                          gttaccgacttcgataaccagcaggcggttgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                                gtcgacctggacttcaccgagggcatggccttcgacaagggctacctgtccccgtacatg
                                                                                                                                                                                                                                                                                                                  atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa 483
                                                                                                                                                                                                                                                                                                                                                                                                            gtcgccgccgtctccgccgagctgctcgacaccgcgcccgatcgacgacaagtccgac
                                                                                                                                                                                                                                                                                                                                                                                                                           gccgacgcggtattcgaggcgttgctggtcggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ctgcgcaacgtcgccggcggcctccccggccgccctgaagaagggcatcgacgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    atcgcgggtgacggcaccaccgcgaccgtgctggcccaggcgctggtccgcgagggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccgacaccgtcaaggtgaccatcggccccaagggccgcaacgtcgtcatcgacaagaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggctccaagccgctgctgatcatcgccgaggacgtcgagggcgaggccctgtcgaccctg
                                                                                                                                                                                                                                                                                                                                                         atcgccgccgtcgccgctctccgcgcaggacaagcaggtcggcgagctcatcgccgag
                                                                                              -----aagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctg
                                                                                                                                     ggcaagatcggttcgatccaggacctgctgccgctgctggagaaggtcatccaggcgggt
                                                                                                                                                                                          gtgaccgaccaggagcgtatggaggccgtcctcgacgacccgtacatcctgatccaccag
                                                                                                                                                                                                                                                                                                    gcgatggacaaggtcggcaaggacggtgtcatcaccgtcgaggagtccaacaccttcggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gacccgtacgagaacctcggcgcccagctcgtcaaggaggtggcgaccaagaccaacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ttcggcgccccgaccatcaccaacgacggcgtcaccatcgcccgtgaggtcgagtgcgac 103/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            al Similarity
868; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Fig 7; 50pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      is that of the gro es e also Q22477-Q22486.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            вр;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            370 A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        38.5%;
69.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            753 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               French
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 622.2;
Pred. No. 4.7e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     e 622.2; Ub ...
1. No. 4.7e-104;
1. matches 383;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <u>e</u>1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  operon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Τ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    promoter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                  1634
                                                                                                                                      1574
                                                                                                                                                                                            1514
                                                                                                                                                                                                                                                1454
                                                                                                                                                                                                                                                                                                     1394
                                                                                                                                                                                                                                                                                                                                                         1334
                                                                                                                                                                                                                                                                                                                                                                                                               1274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1094
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                          603
                                                                                                                                                                                                                                                                                                                                                                                                                                        423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      914
```

<u>,</u>

```
RESULT
022481
1D 291
AC Q2
XX Q2
XX Q2
XX Q2
XX Q2
XX YX
DT 29
DT 29
CN KW He
XX KW He
XX KW WO
CN CD Th
DR WP
DR 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
This is a partial sequence of the groEL-1 gene which codes for the 18 kDa heat shock protein HSP18. The gene actually codes for a 56 kDa protein but this is subjected to post translation modifification to give the 18 kDa HSP18 protein, the partial sequence given here is missing the last 300 nucleotides encoding the C-terminal of the
                                                                                                                                                                                     Recombinant DNA contg. heat inducible promoter gene - also vectors, transformed cells and new proteins of Streptococcus albus
                                                                                                                                                                                                                                                                                                       WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1935
                                                                                                                                             Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      03-SEP-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Heat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                groEL-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q22481 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1018
                                                                                                                                                                                                                                                                                    PSDB;
                                                                                                                                                                                                                                                                                                                                                    Mazodier
                                                                                                                                                                                                                                                                                                                                                                                              (INSP
                                                                                                                                                                                                                                                                                                                                                                                                                                         10-SEP-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19-MAR-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO9204452-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29-JUL-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               868
                                                                                                                                                                                                                                                                                 1992-114358/14.
; R22362.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcggattcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gcggccaccgaggtcgagctgaaggagcgcaagcaccgtctggaggacgccatctgcgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gagaagctccaggagcgcctcgccaagctggccggcggcgtctgcgtgatccgcgtcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gtcaccgtcaccaaggacgacaccgaccatcgtggacggcggcggcaacgccgaggacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gtggtggtcagcaaggacacggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gaggaggtcggcctcaagctcgaccaggccggtctggacgtgctgggcaccgccgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18;
                                                                                                                                                                                                                                                                                                                                                                                              INST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                 P,
                                                                                                                                        Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protein;
                                                                                                                                                                                                                                                                                                                                               Guglielmi
                                                                                                                                                                                                                                                                                                                                                                                              PASTEUR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         albus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              partial sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first
                                                                                                                                           6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      91WO-FR00701
                                                                                                                                      50pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA; 1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HSP18;
                                                                                                                                             French
                                                                                                                                                                                                                                                                                                                                               G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          groEL-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HSP18"
                                                                                                                                                                                                             heat shock
                                                                                                                                                                                                                                  and heterologous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1814
```

```
Qy
                                                                                                        γQ
                                                                                                                                                    Qy
                                            В
                                                           QΥ
                                                                                     ДЬ
                                                                                                                                   DЬ
                                                                                                                                                                               망
                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                            Db
                                                                                                                                                                                                                                             γ
                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                       Ър
                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                 ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
а
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sox
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          56
                                                                                                                                                          724
                                                                                                                                                                                 667
                                                                                                                                                                                                       664
                                                                                                                                                                                                                              607
                                                                                                                                                                                                                                                   604
                                                                                                                                                                                                                                                                         547
                                                                                                                                                                                                                                                                                                                                            484
                                                                                                                                                                                                                                                                                                                                                                                                               367
                                                                                                                                                                                                                                                                                                                                                                                                                                       364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 244
                                                                                        787
                                                                                                                                    727
                                                                                                                                                                                                                                                                                                544
                                                                                                                                                                                                                                                                                                                       487
                                                                                                                                                                                                                                                                                                                                                                    427
                                                                                                                                                                                                                                                                                                                                                                                           424
                                                                                                                                                                                                                                                                                                                                                                                                                                                               307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
nes 865; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          kDa
                                                                                                                                                                                          gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                                                                                                                                                        gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                                                                   accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                                                                                                                                                  gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc
                                                                                                                                                                                                                                                                                                                                                                                                                           gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
         cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggccgacgc
                                       gaccgccgcaaggcgatgctcggcgacatggccaccctcaccggtgccaccgtcatcgcc
                                                       gaccgccgtaaggcgttccttgaggacctggcggtggtgaccggggtggccacgtggtcaac
                                                                                       gtggtcaacaagatccgcggcacgttcaacgccgtcgccgtcaaggcgcccggcttcggt
                                                                                                  gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtccaaggggccgtacttcggt
                                                                                                                                   ggctccaagccgctgctgatcatcgccgaggacgtcgagggcgaggccctgtcgaccctg
                                                                                                                                                                               ggcaagatcggttcgatccaggacctgctgccgctgctggagaaggtcatccaggcgggt
                                                                                                                                                                                                                            gtgaccgaccaggagcgtatggaggccgtcctcgacgacccgtacatgctgatccaccag
                                                                                                                                                                                                                                                                        gtcgacctggacttcaccgagggcatggccttcgacaagggctacctgtgcccgtacatg
                                                                                                                                                                                                                                                                                                                                                                             atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                                                                              gtcggcgccgtctccgccgagctgctcgacaccgcgcgcccgatcgacgacaagtccgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ttoggogccccgaccatcaccaacgacggcgtcaccatcgcccgtgaggtcgagtgcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gcgatggacaaggtcggcaaggacggtgtcatcaccgtcgaggagtccaacaccttcggt
                                                                                                                                                                                                                                                                                                                                                                  atcggcgccgtcgcgggtctccgcgcaggacaagcaggtcggcgagctcatcgccgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctgcgcaacgtcgccgccggcctccccggccgccctgaagaagggcatcgacgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gacccgtacgagaacctcggcgcccagctcgtcaaggaggtggggaccaagaccaacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccgacaccgtcaaggtgaccatcggccccaagggccgcaacgtcgtcatcgacaagaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aagattctgaagttcgacgaggacgcccgtcgcgcccttgagcgcggcgtgaaccagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1320
                                                                                                                                              -aagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ВP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     38.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Α;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q22477-Q22486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      No. 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 617.4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ი
ი
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3.3e-103;
1es 386;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Η,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                   486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183
                                                                                       846
                                                                                                                                    786
                                                                                                                                                          777
                                                                                                                                                                                 726
                                                                                                                                                                                                      723
                                                                                                                                                                                                                                                   663
                                                                                                                                                                                                                                                                         606
                                                                                                                                                                                                                                                                                                603
                                                                                                                                                                                                                                                                                                                       546
                                                                                                                                                                                                                                                                                                                                           543
                                                                                                                                                                                                                                                                                                                                                                                         483
                                                                                                                                                                                                                                                                                                                                                                                                               426
                                                                                                                                                                                                                                                                                                                                                                                                                                      423
                                                                                                                                                                                                                                                                                                                                                                                                                                                              366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              66
```

363

907

gaggaggtcggcctcaagctcgaccaggccggtctggacgtgctgggcaccgccgccgc

2;

```
DR XXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 12
T14265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ID XXX ACC CAN ACC CAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                         T14265 is the GroEL gene derived from the coryneform bacterium, Brevibacterium flavum strain MJ-233. The gene may be used for the recombinant prodn. of the groEL protein. The groEL protein is a chaperonin protein, the coryneform equivalent of hsp60, which ensures that other cellular proteins are folded correctly. Fragments of the GroEL gene are useful for genetic engineering of bacteria to increase activity, extend life and increase the formation and secretion of an objective protein.
                                                                                                                                                                                                                                                                                                                                                 DNA fragment contg. gene encoding GroEL protein - Coryneform bacteria, used for recombinant prodn. c and in genetic engineering of bacteria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1078
                                                                                                                                                                                                                                                                                                    Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (MITU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 07-SEP-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JP08070873-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Brevibacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1027
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   07-SEP-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Brevibacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16-SEP-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               T14265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  T14265 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     folding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1996-203153/21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acccgcgccgcggtcgaggagggcatcgtctccggtggtggctccgcgctggtccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gcggccaccgaggtcgagctgaaggagcgcaagcaccgtctggaggacgccatctccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgagggatgcggtcgcggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gagaagctccaggagcgcctcgccaagctggccggcggcgtctgcgtgatccgcgtcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggtgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gtcaccgtcaccaaggacgacaccatcgtggacggcggcggcaacgccgaggacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gtggtggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ) MITSUBISHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   coryneform
                                                                                                                                                                                                                                                                                                  Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                  8-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94JP-0213483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   94JP-0213483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                flavum MJ-233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   flavum MJ-233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /*rag= a
/product=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CHEM
                                                                                                                                                                                                                                                                                            11pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CORP
                                                                                                                                                                                                                                                                                                  Japanese
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GroEL_protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   recombinant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GroEL gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                chaperonin;

    derived
    of GroEL

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein;
                                                                                                                                                                                                                                                                                                                                                                                                         from
                                                                                                                                                                                                                                                                                                                                                                             protein
```

1263

1197 1146 1137 1077

1086

1017 1026

Query

Match

 \mathfrak{S}

98;

Score

548.

2

DB

17;

Length 1647;

Sequence

1647

BP;

349

Ą,

458

Ç

497

<u>ი</u>

343

Т,

```
Qγ
                                            В
                                                                      Qy
                                                                                                      밁
                                                                                                                            Qy
                                                                                                                                                               뫄
                                                                                                                                                                                        Qy
                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                              ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity 60.3
Matches 954; Conservative
                1009
                                            967
                                                                         949
                                                                                                      907
                                                                                                                                  889
                                                                                                                                                               847
                                                                                                                                                                                              829
                                                                                                                                                                                                                           787
                                                                                                                                                                                                                                                        769
                                                                                                                                                                                                                                                                                                                709
                                                                                                                                                                                                                                                                                                                                               667
                                                                                                                                                                                                                                                                                                                                                                          649
                                                                                                                                                                                                                                                                                                                                                                                                     607
                                                                                                                                                                                                                                                                                                                                                                                                                                 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                               547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        487
                                                                                                                                                                                                                                                                                     727
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4
gaagcggtggccaaccgggcgaacccacttgcgtgccgagatcgacaagagcgattcggat
                                                         gcccgacgcgtggttggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgca
                                                                                                                                                                                                                                                                                                                                                                                                     atctccggctacttcgcaaccgacatggagcgcctcgaggctgttctggaagatccttac
                                          gcacgcaaggttgttgtcaccaaggatgacaccaccatcgttgatggcgcaggttctgag
                                                                                                    gtcatctccgaagaggttggcctctcccttgagaccgctgatctgccacttctaggccag
                                                                                                                      gtggtcaaccccgacgccggcattgtgctgcgcgaggttgggcttggaggtgctgggctcg
                                                                                                                                                               ggcttcggcgaccgtcgtaaggctcagctgcaggacatcgcagttctgaccggtggccag
                                                                                                                                                                             tacttcggtgaccgccgtaaggcgttccttgaggacctggcggtggtgacgggtggccac
                                                                                                                                                                                                                                        gcgacgctggtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccg
                                                                                                                                                                                                                                                                                                 gttgcaggaacgggtaagccactactgatcgtggctgaagacgttggagggcgaagcgttg
                                                                                                                                                                                                                                                                                                                                                            atcctgctacaccaagaccagatcagctcgcttcccgatctgttgccattgctggaaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                  gtcatgcagtccggcaagcctttgctgatcatctctgaggacgtcgagggcgaggctctg
                                                                                                                                                                                                                                                                                                                                           atcctgctggtttccggcaagatctccaacatcaaggacctgctcccactgctggagaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ctgaggctagtggccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gtcgcaggtgacggcaccaccaccgctaccgtattggcacaggctctggttcgggaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccgccaccaagacccaacgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tttggcggacccacggttaccaacgacggcgtcacggtggcacgttgagatcgagctggaa 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccgacaccgtgcgggtgacgctggggccgcgcggcatgtggtgctggccaaggcg 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                                                                                                                                                                         tocaccotggttgtcaacaagatccgtggcaccttcaagtctgttgctgttaaggctccg
                                                                                                                                                                                                                                                                                                                                                                                                                               ttgtcggcatacttcgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                            tccaacactttcggtgttgagctcgaggttactgagggtatgcgctttgataagggctac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcaatgtacgcagttggtggcggcaagctgaacaaggattccgtcatcactgttgaagag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gcgatgaa-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              atcgctgctaccgctggtatctccgcagctgacccagctatcggcgcacagattgctaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ctgcgcaacgttgctggctctaacccaatgggcatcaagcgtggcatcgagaaggct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gatccttacgagaagatcggcgcagagctggtcaaggaagtcgctaagaagactgatgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gctgacgctgttaaggttactttgggaccaaagggccgtaacgtcgttttggaaaaggct 126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          aagatcatcgcctttgatgaggaagcacgtcgtggcctagaaaagggactgaacaccctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tggggtgccccaaccattaccaacgatggtgtcaccatcgcacgtgagatcgagcttgag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -caaggtcggccacgacagcgtggtcagcgtcaaggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No. 9.60
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .6e-91;
es 608;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                             1026
                                                                          1008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           186
                                                                                                       966
                                                                                                                                                               906
                                                                                                                                                                                              888
                                                                                                                                                                                                                           846
                                                                                                                                                                                                                                                      828
                                                                                                                                                                                                                                                                                  786
                                                                                                                                                                                                                                                                                                               768
                                                                                                                                                                                                                                                                                                                                           726
                                                                                                                                                                                                                                                                                                                                                                        708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            66
                                                                                                                                                                                                                                                                                                                                                                                                     666
                                                                                                                                                                                                                                                                                                                                                                                                                                 648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63
                                                                                                                                                                                                                                                                                                                                                                                                                                                              606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 246
```

Claim

ω --Fig

3A-B;

176pp; English

```
Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                        1501
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1309
        New nucleic acid encoding heat shock protein-60 from Streptococcus, useful in vaccines, as carriers for other immunogens, as anticancer agents and for diagnosis
                                                                                                                                                                                                                                                                                                                                                                                                   1549
                                                                                                                                                                                                                                                                                                                                                                                                                                            1489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1267
                                                                                 Mizzen
                                                                                                                                                                                       WO9935270-A1
                                                                                                                                                                                                           Streptococcus
                                                                                                                                                                                                                                        Heat shock protein; Hsp60-1; immune response;
                                                                                                                                                                                                                                                              DNA encoding
                                                                                                                                                                                                                                                                                                                                                                              1561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1129
                                                                                                                         31-DEC-1997;
                                                                                                                                              29-DEC-1998;
                                                                                                                                                                   15-JUL-1999
                                                                                                                                                                                                                                                                                   22-SEP-1999
                                                                                                                                                                                                                                                                                                         x86154;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1027
                                                                                                     (STRE-)
                                                                                                                                                                                                                                                                                                                            X86154 standard;
                                                    1999-430397/36
DB; Y23903.
                                                                                                                                                                                                                                                                                                                                                                                      gagacggtcgtggtcgacaagcc 1571
                                                                                                                                                                                                                                                                                                                                                                                                                                aaggtgactaggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgaacgtgaacaccctgagctatggtgacttggccgctgaccggcgtcatcgacccggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gctggcttggacggctcggtggtggtcaacaaggtcagcgagctacccgccgggcatggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ctcggtgtcgacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gtcgcggccaaggccgcggtcgaggaggcatcgtccctggtgggggagcctcgctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gaggctgtcgttgctgacaagcc
                                                                                                                                                                                                                                                                                                                                                                                                                     aaggtcacccgctccgcactccagaacgctgcgtccattgcagctttgttcctgaccact
                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctcaacgctgcaaccggcgagtacgtcgacctcatggctgcgggcatcaacgacccagta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gctggcctcgagccaggcgttgttgctgacaaggtttcccagctcccacagggcgagggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctgcaggctgctcacgtcctggacaacgatcttga----gctttccggcgacgaggca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtccgtaacgctaaggcagctgttgaagagggcatcgttgcaggcggtggcgttgcgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tacgaccgtgagaagctcaacgagcgcctggctaagcttgccggcggcgttgcagtgctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gctcagatcgagggtcgcgttaaccagatccgcgttgagatcgagaactctgattccgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tgggatcgggaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatc
                                                                                Ļ
                                                                                                     STRESSGEN BIOTECHNOLOGIES
                                                                                Wisniewski
                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                  (first
                                                                                                                                                                                                           pyogenes
                                                                                                                                                                                                                                                              Streptococcus
                                                                                                                         97us-0001737
                                                                                                                                              98WO-CA01203
                                                                                                                                                                                                                                                                                                                            DNA;
                                                                                                                                                                                                                                                                                  entry)
                                                                                                                                                                                                                                                                                                                            1662
                                                                                                                                                                                                                                sarcoma;
                                                                                                                                                                                                                                                                                                                           ВP
                                                                                                                                                                                                                                                             pyogenes heat shock protein (Hsp)60-1.
                                                                                                     CORP
                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                              immunological carrier;
therapy; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                     1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1308
                                                                                                                                                                                                                                                                                                                                                                                                                                          1548
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1146
```

```
The present sequence encodes a heat shock protein, designated The protein, its fragments, variants and fusion proteins, are
```

(e.g. sarcoma or cancers of breast, ovary, prostate, lung, pancreas liver). The Hsp60 polynucleotide is used for recombinant production of the protein, as a source of primers and probes for detecting streptococci in standard hybridization/amplification assays, and therapeutically in gene therapy vectors. immunosuppressive so provide an increased response to any conjugated fused antigen. Also, where used for cancer control, they lack the side effects associated with endotoxins. They can also be used to detect specific antibodies and in treatment or prevention of tumours used to elicit or enhance an immune response against Streptococcus, and to elicit a similar response to a target antigen fused to the protein. Unlike other immunological carriers, Hsp60 proteins are no are not side or. or

Sequence 1662 BP; 429 A; 414 C; 498 <u>ი</u> 321 T; 0 other;

```
밁
                          Qy
                                                                             δõ
                                                                                                              Ър
                                                                                                                                        Qγ
                                                                                                                                                                       В
                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                          ΩV
                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δλ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 925; Conserv
                                                                                                                 574
                                                                                                                                                                         514
                                                                                                                                                                                                     491
                                                                                                                                                                                                                                                           434
                                                                                                                                                                                                                                                                                                                    374
                                                                                                                                                                                                                                                                                                                                                 334
                                                                                                                                                                                                                                                                                                                                                                             314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                214
                                                                                                                                                                                                                                  454
                                                                                                                                                                                                                                                                                         394
                                                                                                                                                                                                                                                                                                                                                                                                          274
                                                                                                                                                                                                                                                                                                                                                                                                                                      254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14 aatacgacgaaaccgcgcgtcgcccatggaggtcggcatggacaagctggccgacaccg
                                                                                                                                                                                        acaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggcaccgagt
                                                                                                                                                                                                                                                                                                                                                                tggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggccgccgacgcgg
                                                                      acttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaagaccaaga
                                                                                                                             tggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttcgttaccg
                                                                                                                                                                                                                                              tggcgacggtgtcctc---gcgcgacgagcagatcggtgacctggttggcgaagcgatga
                                                                                                                                                                                                                                                                                                       tattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggcatcgcgcagg
                                                                                                                                                                                                                                                                                                                                                                                                     acggtaccaccaccgcgaccgtgctggctcaggctatcatcaccgaaggtctgaaagccg
                                                                                                                                                                                                                                                                                                                                                                                                                       acggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggcctgaggctag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgatgttgccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaagatccgtttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgcgggtgacgctggggccgcggcggcatgtggtgctggccaaggcgtttggcggac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aattcggtaacgacgctcgtgtaaaaatgctccgcggcgtaaacgtactggcagacgcag
tetecaaeateegegaaatgetgeeagtgetggaageegttgegaaageaggeaaacege
              tcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggtaagccac
                                                       ataaagtcggtaaagaaggcgtgatcaccgttgaagacggtaccggtctggaagacgaac
                                                                                                                                                                                                                             taggtaccatctccgctaactccgacgaaaccgtaggtaaactgatcgcggaagcgatgg
                                                                                                                                                                                                                                                                                      ctgttgaagaactgaaagcgctgtccgtaccgtgctctgactctaaagccattgctcagg
                                                                                                                                                                                                                                                                                                                                               ttgctgcgggcatgaacccaatggatctgaaacgtggtatcgacaaagctgtcgcgtccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                aaaacatgggcgcagatggtgaaagaagtggcctctaaagcgaacgacgctgcaggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      caaccatcacgaaagatggtgtttctgtagcacgtgaaatcgagctggaagacaagttcg
                                                                                                              tggacgtggttgaaggtatgcagttcgaccgcggttacctgtccccatacttcatcaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ttaaaagtaaccctgggcccgaaaggccgtaacgtagtgctggacaaatccttcggcgcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            31.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 509.8; DB 2
Pred. No. 7.9e-84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches 627;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1662;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                           610
                                                                                                                                                                                                    550
                                                                                                                                                                                                                               513
                                                                                                                                                                                                                                                           490
                                                                                                                                                                                                                                                                                      453
                                                                                                                                                                                                                                                                                                                   433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       93
 753
                                                        693
                                                                                   670
                                                                                                                633
                                                                                                                                                                       573
                                                                                                                                                                                                                                                                                                                                                 393
                                                                                                                                                                                                                                                                                                                                                                            373
                                                                                                                                                                                                                                                                                                                                                                                                        333
                                                                                                                                                                                                                                                                                                                                                                                                                                   313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \omega
```

Š

731

tactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgtcaacgcga

```
RESULT 14
X86152
                                                                                                                                                                                                 밁
                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                 1588
                                                                                                                                                                                                                          1571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1031
             cancer
                                                  DNA encoding a Streptococcus
                                                                                                                                 X86152 standard;
                        Heat shock protein; Hsp60-1; immune response;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                754
                                                                                                                                                                                                                      c 1571
                                                                                                                                                                                                                                                c 1588
                                                                                                                                                                                                                                                                                                                  atggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtcggcggtgt 1510
                                                                                                                                                                                                                                                                                                                                                                                                                         aagcccttgccgccgttgttctggatcgccgccaacgcttggcttggacggctcggttg 1390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         accacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaaaagcttggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtcagatccgtaagcagatcgaagaagccacttccgattacgaccgtgaaaaactgcagg
                                                                                                                                                                                                                                                                                                                                                                        tggtcaacaaggtcagcgagctacccggccgggcatgggctgaacgtgaacaccctgagct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aagacaccaccatcatcgatggcgtgggcgacgaagcggcgattcagggccgtgttg
                                                                                                                                                                                                                                                                                                   tgaccaacaacgtgaaagcaggcgaaggtaactacggttacaacgcagcaactgaagaat
                                                                                                                                                                                                                                                                                                                                                                                                           gcgcaatggaagctccactgcgtcagatcgtgtccaacgccggtgaagagccatctgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgtgttctccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tagaagaaggcgtggttgctggtggtggtgtggcgctggtgcgtgttgccgcgaa---ac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccgcaaggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ttgaaatgaaagaaaaaagcacgcgttgacgatgccctgcacgcgacccgtgctgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          agcgcgtagcgaaactggcaggcggtgttgcggtaatcaaagtcggtgctgcgactgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaaccgggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ttgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggtggtcagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgatgctgcaggatatcgctaccctgaccggcggtaccgtcatctctgaagagatcggta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgttccttgaggacctggcggtggtgacgggtggcacgtggtcaaccccgacgccggca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tgtccggcctgactg--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tggagctggaaaaagcgaccctggaagacctgggccaggctaaacgtgttgtgatcaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tgcgtggcatcgtgaaagtggctgcggttaaagcacctggcttcggcgaccgccgtaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tggttatcattgctgaagacgttgaaggcgaagcgctggcgaccctggtggttaacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA;
                                                                            entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                -ctcagaacgaagatcagaacgtgggtatcaaagttgcgctgc
             sarcoma;
                                                 pneumoniae heat shock protein (Hsp)60-1
             cancer;
            gene
          therapy;
                        immunological
                                                                                                                                                                                                                                                                             1570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            873
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               813
```

```
멍
                                                                                  δÃ
                                                                                                                  Ъ
                                                                                                                                         Qy
                                                                                                                                                                           DЬ
                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The present sequence encodes a heat shock protein, designated Hsp60-1 The protein, its fragments, variants and fusion proteins, are used to elicit or enhance an immune response against Streptococcus, and to elicit a similar response to a target antigen fused to the protein. Unlike other immunological carriers, Hsp60 proteins are not immunosuppressive so provide an increased response to any conjugated fused antigen. Also, where used for cancer control, they lack the side effects associated with endotoxins. They can also be used to detect specific antibodies and in treatment or prevention of tumours (e.g. sarcoma or cancers of breast, ovary, prostate, lung, pancreas on ithe protein, as a source of primers and probes for detecting streptococci in standard hybridization/amplification assays, and the protein in standard hybridization/amplification assays, and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 1665 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mizzen L,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  therapeutically in gene therapy vectors.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agents and for diagnosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     31-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15-JUL-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (STRE-)
 394
                             374
                                                          334
                                                                                     314
                                                                                                                  274
                                                                                                                                              254
                                                                                                                                                                            214
                                                                                                                                                                                                        194
                                                                                                                                                                                                                                     154
                                                                                                                                                                                                                                                                  134
                                                                                                                                                                                                                                                                                             94
                                                                                                                                                                                                                                                                                                                         74
                                                                                                                                                                                                                                                                                                                                                    34
                                                                                                                                                                                                                                                                                                                                                                                 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nucleic acid encoding heat shock protein-60 from Streptococcus, ful in vaccines, as carriers for other immunogens, as anticancer
ctgttgaagaactgaaagcactgtccgtaccgtgctccgactctaaagctattgctcagg
                                                                                                                                acggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggcctgaggctag
                                                                                                                                                                                          aattcggtaacgacgctcgtgtgaaaatgctgcgcggcgtaaacgtactggcagatgcag
                                                                                                                                                                                                                                                                                                                                                                     aatacgacgaaaccgcgcgtcgcgccatggaggtcggccatggacaagctggccgacaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1999-430397/36
               tattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggcatcgcgcagg
                                                                                                                                                                         aaaacatgggtgcgcagatggtgaaagaagttgcctctaaagcgaacgacgctgcaggtg
                                                                                                                                                                                                                                                    tggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggccgccgccgcgg
                                                                                                                                                                                                                                   cgaccatcactaaagatggtgtttccgtagcacgtgaaatcgaactggaagacaagttcg
                                                                                                                                                                                                                                                                                                           tgcgggtgacgctggggccgcggcggcatgtggtgctggccaaggcgtttggcggac 133
                                                                                                                 acggtaccaccaccgcaaccgtactggctcagtccatcatcactgaaggcctgaaagccg
                                                                                                                                                                                                                                                                                            tgaaagttaccctcggcccaaaaggccgtaacgtagttctggataaatctttcggtgcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ω
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRESSGEN BIOTECHNOLOGIES CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Wisniewski
                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1A-B; 176pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pneumoniae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97US-0001737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98WO-CA01203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        438 A; 401 C;
                                                                                                                                                                                                                                                                                                                                                                                                                              29.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ţ
                                                                                                                                                                                                                                                                                                                                                                                                                0
                                                                                                                                                                                                                                                                                                                                                                                                             Score 474.4; DE Pred. No. 1.9e-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480 G; 346
                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Η;
                                                                                                                                                                                                                                                                                                                                                                                                                656;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        other;
                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                              9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hsp60-1.
                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                     213
                                                                                                                                                                                                                                                                  193
                                                                                                                                                                                                                                                                                             153
                                                                                                                  333
                                                                                                                                                                            273
                                                                                                                                                                                                                                                                                                                                                      93
                                                                                                                                                                                                                                                                                                                                                                                   73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         side
                                                          393
```

2

or

```
1511
                                                                                                                                                                                                            1348
                                                                                                                                                                                                                                                                                             1288
                                                                                                                                                                                                                                                                                                                                                                         1234
                                                                                                                                                                                                                                                                                                                                                                                                                  1211
                                                                                                                                                                                                                                                                                                                                                                                                                                                          1174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1031
                                                                                                                                                                                                                                                                                                                                   1271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        731
                                                                 atggtgacttggccgctgaccggctcatcgacccggtcaaggtgactaggtcggcggtgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             accacttgcgtgccgagatcgacaagagcgattcgggattgggatcgggaaaagctttggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ttgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggtggtcagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ttcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgaccgccgtaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgtcaacgcga
tgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggtcgacaagc
                                        tggtcaacaaggtcagcgagctacccggccgggcatggggctgaacgtgaacaccctgagct
                                                                                                                                                                                                     gcgcaatggaatccccactgcgtcaaatcgtactgaactgcggcgaagagccgtctgtag
                                                                                                                                                                                                                                 aagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggatcggttgg
                                                                                                                                                                                                                                                                                                                      tgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctccggtgtctacgacgtgttctccg
                                                                                                                                                                                                                                                                                                                                                                                            tcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccgcaaggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ttgaaatgaaagaagaagcccgcgttgaagatgccctgcacgctacccgtgctgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ctcagattcgtcagcagatcgaagaagcaacttccgactatgaccgtgaaaaactgcagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aggacgacacggtcattgtcgacggcggcggcgaccgcgcagaagcggtggccaaccgggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caatgctgcaggatatcgctaccctgaccggtggtaccgttatctctgaagagatcggta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggtaagccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaagacaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    acaaggtcggcacgacagcgtggtcagcgtcaaggaatcctccacgctgggcaccgagt
                                                                                                                           tggctaacaccgtgaaagccggtgacggtaactacggttacaacgctgcaactgaagaat
                                                                                                                                                                                                                                                                                        aaattgccggcctgaaaggtcagaacgaagaccagaacgtaggtatcaaagttgcgctgc
                                                                                                                                                                                                                                                                                                                                                                       tagaagaaggcgtggttgctggtggtggcgttgcgctgattcgcgtagc----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     agcgcgtagcgaaactggcaggcggcgttgcggttatcaaagttggtgctgcgactgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aagataccaccaccatcatcgatggcgtgggcgacgaagctgcaatccagggtcgcgtga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tggagctggaaaaagcaactctggaagatctgggccaggcgaaacgcgttgttatcaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgttccttgaggacctggcggtggtgacggtggccacgtggtcaaccccgacgccggca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tgcgcggtatcgtaaaagtcgctgcggttaaagcacctggcttcggcgatcgtcgtaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tgctgatcatcgctgaagatgttgaaggcgaagcgctggcaactctggttgttaacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tctccaacatccgcgaaatgctgccggttctggaagctgtagcgaaagcaggcaaaccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttcgttaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acaaagtcggtaaagaaggcgtgatcaccgttgaagacggtaccggtctgcaggacgaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tggacgtggttgaaggtatgcagttcgaccgtggctacctgtctccttacttcatcaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ttggtaccatctccgctaactccgacgaaaccgtaggtaaactgatcgctgaagcgatgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tggcgacggtgtcctc---gcgcgacgagcagatcggtgacctggttggcgaagcgatga
                                                                                                                                                                                                                                                                                                                                                                     -gtcta
                                                                                                                                                                                                        1407
    1570
                                                                                                                           1467
                                                                                                                                                                                                                                                                                        1347
                                                                                                                                                                                                                                                                                                                                 1330
                                                                                                                                                                                                                                                                                                                                                                         1287
                                                                                                                                                                                                                                                                                                                                                                                                                1270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1053
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1030
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   873
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  753
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        490
```

Вb

δÕ

Qy

20 Db Db

g 99

24 OA

밁

Ş

Query Match Best Local Similarity

29 5**7**

.18;

Score Pred.

470.2; DB 2 No. 1.1e-76;

21;

Length

Ωy

DЬ

δÃ

밁

40 40 40 40

Вþ

```
RESULT
254509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
           novel Neisseria meningitis and N. gonorrheae polyncleotides and polypeptides. Z54537 to Z54576 and Z54616 to Z55473 represent primers used in the exemplification of the present invention. The polypeptides, the polyncleotides, antibodies and compositions of the invention can be used as vaccines, as diagnostic reagents, and as immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to screen for agonists or antagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invention may also be used in gene therapy protocols.
                                                                                                                                                                                                                                                                                                                                         02-SEP-1998;
02-SEP-1998;
09-OCT-1998;
09-OCT-1998;
09-OCT-1998;
09-OCT-1998;
25-FEB-1999;
                                                                                                                                                                                                                                 WPI; 200
P-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria meningitidis; Neisseria gonorrheae; antigenic; diagnosis; immunogenic; infection; antibacterial; gene therapy; ds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1528
Sequence
                                                                                                                                                                         Claim 7; Page 1387-1388; 1453pp; English.
                                                                                                                                                                                                 Novel Neisserial polypeptides predicted to vaccines and diagnostics -
                                                                                                                                                                                                                                                                 Tettelin
                                                                                                                                                                                                                                                                             Petersen
                                                                                                                                                                                                                                                                                       Fraser C,
                                                                                                                                                                                                                                                                                                          (CHIR )
                                                                                                                                                                                                                                                                                                                                                                                                          01-MAY-1998;
31-JUL-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                            30-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      W09957280-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis ORF 982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Z54509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15
                                                                                                                                                                                                                                 2000-062150/05.
DB; Y75747.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              _ cg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agtacgcggcttctgttgcgggtctgatgatcaccaccgagtgcatggttaccgacctgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       standard;
                                                                                                                                                                                                                                                                                                           CHIRON CORP.
INST GENOMIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1572
 1635
                                                                                                                                                                                                                                                                 Ŧ,
                                                                                                                                                                                                                                                                         Galeotti C, Grandi G, Pizza M, Rappuoli
                                                                                                                                                                                                                                                              Venter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
 B₽;
                                                                                                                                                                                                                                                                                                                                         98US-0094869.
98US-0098994.
98US-0099062.
98US-0103749.
98US-0103794.
98US-0103796.
                                                                                                                                                                                                                                                                                                                                                                                                                      98US-0083758
                                                                                                                                                                                                                                                                                                                                                                                                                                            99WO-US09346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNA;
 448
                                                                                                                                                                                                                                                                 JC;
                                                                                                                                                                                                                                                                                                             RES.
Α,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1635
                                                                                                                                                                                                                                                                           Grandi G,
Rappuoli R,
440 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           partial
 456
                                                                                                                                                                                                                                                                          Hickey
Ratti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          infection; meningitis; septicaemia;
ç;
 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA sequence
                                                                                                                                                                                                                                                                           တ မြ
₩,
                                                                                                                                                                                                            be useful antigens
 0
                                                                                                                                                                                                                                                                           Masignani V,
Scalato E,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IJ
                                                                                                                                                                                                                                                                          Scarselli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NO:2965
                                                                                                                                                                                                            for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1587
                                                                                                                                                                                                                                                                             3
```

	agcgattacga	ac	Db 1040
	tcggattgggatcgggaaaagcttggc	cacttgcgtgccgagatcgacaagagcga	Оу 1031
	gacgcagcccaaatcgaagcgcgtgttg 103	aagaaaacaccaccatcatcgacggcttcggc	
	ggrcaggccaaacgcarcgaaaccggta y	aracacacatrateatracacacacacacacacacacacacacacacacacaca	Ov 971
	ggctcggcccgacgcgtggtggtcagca 97	gtgctgcgcgagg	91
	ggcacagtgatttccgaag	gctgcaagacatcgctatcctgaccgg	Db 860
	ggccacgtggtcaaccccgacgcgg	gttccttgaggacctggcggtggtgacgg	Qy 851
)999cc9cactcggcgaccgccgcaaag 859 	tccgcggcattctgaaaaccgttgccgttaaa	Db 800
	מייייין של היא המיייייים מני מייייים מני מייייים מני מיייים מני מייים מני מיייים מני מייים מייים מני מייים מני מייים מני מייים מיים מייים	ofoffenskarkankankarkankankark	70
	ق د	ctgatcgtggctgaagacgtggagggcga	Qy 731
	gaacaagtggccaaagccagccgtccgc 73	at	o ,
	ceyeteyeareyetyeteyacaaaaaa o	cagctcgcttcccgatctgttgccattgct	67
	control	tcgataaccagca	Qy 611
			٠ س
	ggcttcttgtcggcatacttcgttacc	ggagttcaccgaaggtattggcttccaca	Qy 551
	aaggaatcctccacgctgg gaagacggcaaatctttgg	acaaggtcggccacgacagcgtggtcagcgtc	Qy 491 рь 500
	gtcggcgcattattgccgaagcgatgg 49	cggctctatttccgccaactctgacgaac	4
	atcggto	tgtcctcgcgcgacgagca	Qy 434
	acttctaaagaaatcgcccaag 43	gttgaagagctgaaaaacatcgccaaacc	38
	qqcaaqaccqqcatcqcqcaqq 43	Attcqaqqcqctqctqqcatcqqccacqcc	
	gtgggaatcggcaag cgcggtatcgacaaa	gcgctcgg gacctgaa	Qy 314 Db 320
	gttgccgaaggtatgaaatacg	acygractaccycarcarcarcarycyca acygracyactaccycarcytattyycyca	26
		ECULOUS + 10 + 400 400 1000 400 400 400 1000	s
	ggccaccaagaccaacgatgttgccggtg 253 	aagacttgggcgcccagctggtgaagtcggt aaaatatgggcgcgcaaatggtgaaagaagt	Db 200
	ааауааагсуаасгуааауасааугггу ту	й саса гоассавай асд су гаассу гоус	
	19	acggttaccaacgacggcgtcacggtggc	1 13
	ttgaccgcgcttt	cgtaaccttgggtcccaaaggccgca	Db 80
	tggtgctggccaaggcgtttggcgga	.gcgggtgacgctggggccgcgcggccggc	Оу 74
	aaacggcgtgaacattttggcaaacgccg 79	aagtccgccaaaaaatgc	Db 20
ω ,.	tches 653; Indels 9; Gap	901; Conservative 0; Mism	Matches

ρy Qy д Qy B Qy рь Дb Qy Вρ Вþ QY Ъ ρy В Qy 1454 1574 1571 1514 1511 1451 1394 1391 1334 1331 1277 1271 1220 1211 1160 1151 1100 1091 ctg cgg tgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggtcgacaagc aacacgccgcgtctatcgccggcctgatgctgaccacagactgcatgattgctgaaatcc ccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcgggccgccgcgaggccgcgcg 1210 tggtcaacaaggtcagcgagctacccggccgggcatgggctgaacgtgaacaccctgagct ttgtgaacaaagtgttggaaggcaaaggcaactatggttacaacgctggcagcggcgaat tggaaatgaaagagaaaaagaccgcgtggaagacgcgctgcacgctacccgcgcagccg 1573 1573 1570 1453 1450 1390 1219

Search completed: January 12, Job time: 25947 sec 2001, 20:01:03

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       btal number of hits satisfying chosen parameters:
GenEmbl:*

1: 9b_bal:
2: 9b_bal:
3: 9b_on:*
4: 9b_ov:*
5: 9b_pl:
6: 9b_pl:
9: 9b_pr:
10: 9b_r:
11: 9b_r:
12: 9b_r:
13: 9b_r:
14: em_f
15: em_f
16: em_f
17: em_f
17: em_f
18: em_g
20: em_g
31: 9
33: em_g
3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1118133 seqs, 2558875100 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 12, 2001, 12:43:46; Search time 6876.06 Seconds (without alignments) 1203.509 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 agcaagctgatcgaatacga....accacgggcacgcgcactga 1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-461-774-1
1617 -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gb_pr2:*
gb_pr3:*
gb_ro:*
gb_sy:*
gb_un:*
em_fun:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gb_ba1:
gb_ba2:
gb_om:
gb_ov:
gb_ph:
gb_ph:
gb_p11:
gb_p12:
gb_pr1:
                                           em_in:
em_om:
em_or:
em_or:
em_pat:
em_pl:
em_pl:
em_y:
em_sts:
em_sts:
em_vi:
em_vi:
em_vi:
em_vi:
em_vi:
em_bal:
gb_htgl:
gb_htgl:
gb_htgl:
gb_htgl:
gb_htgl:
gb_htgl:
em_bal:
em_bal:
gb_htgl:
gb_htgl:
gb_htgl:
gb_htgl:
em_bal:
em_bal:
em_bal:
em_bal:
em_bal:
em_bal:
em_bal:
em_huma:
gb_htgl:
em_huma:
gb_htgl:
em_huma:
gb_htgl:
em_huma:
gb_htgl:
em_huma:
gb_htgl:
em_huma:
gb_htgl:
em_huma:
em_hu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 em_hum1:*
em_hum2:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2236266
```

74: 75: 76: 77: 79: 80: 81: 83:	58	55544 5555 5564 5565 5565 5565 5565 556
m_htg m_htg b_pr6 b_pr7 b_sts b_sts b_sts b_pat b_pat b_pat b_pat b_pat b_pat	0 < < > > > > > > > > > > > > > > > > >	

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result

Query

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
MTCY78/c
LOCUS
                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     O
                                                                                                                                                                                                                                                                                                                                                                              JOURNAL MEDLINE
                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                          REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                      JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         685.6685.6685.6681.8868686.685.665.88665.88665.88665.88665.88665.88665.88665.886665.886665.886665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.86655.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.8665.86
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Corvnebacterineae; Mycobacteriaceae;
                                                                              Details of M. tuberculosis sequencing at the available on the World Wide Web.
                                                                                                                     Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhillsanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:1449358.
                                                                                                                                                                                                                                                                                                                                  Erratum:[[published erratum appears 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                complete genome sec
Nature 393 (6685),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium tuberculosis
277165 AL123456
277165.1 GI:3261609
                                                                                                                                                                                                                                                                          Direct Submission
                                                                                                                                                                                                                                                                                           Parkhill, J.
                                                                                                                                                                                                                                                                                                                                                                              98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                           Deciphering the biology of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (bases 1 to 33818)
                                                                                                                                                                                                                                                                                                             (bases 1 to 33818)
                   , http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have renumbered from the original cosmid submissions but the old designations are in brackets after the new gene numbers.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     335.444442
335.44422
347.245
355.477
355.33
355.33
355.33
355.33
355.33
355.33
355.33
355.33
prediction was
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     33818 bp
                                                                                                                                                                                                                                                                                                                                                                                         sequence
5), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
81
81
73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MLCB1450
AB039274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CVNGROESLA
BPU12277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAU29483
AF145252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AE004854
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AB036414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AF222061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AB015985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLGROESEL
SLGROEL2G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MSGANTM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AR080045
AR085971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TTHCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AR028759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AR028758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AR085943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H37Rv complete
                                                                                                                                                                                                                                                                                                                                                             ä
Markov
                                                                                                                                                                                                                                                                                                                                                          Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BCT
                                                                                                                                                                                                                                                                                                                                                                                                                                           tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           genome;
                                                                                                    Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AF222061 Propionib
AB036414 Propionib
U29483 Thermus agu
AF145252 Rhodother
AB015985 Paracoccu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AL035159 Mycobacte
AB03974 Propionib
AR028758 Sequence
AR028759 Sequence
I01709 Sequence 4
AJ250409 Thermus t
D45880 Thermus the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AR085971 Sequence
AR080017 Sequence
AR085943 Sequence
X95970 S.lividans
X95971 S.lividans
U90204 Tsukamurell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            M99443 GROESL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AE004854 Pseudomor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        M14341 M.leprae 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    M76658 Streptomyce
AR080045 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           segment 145/162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   17-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bordetella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                 gene
                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_teature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        initiation codon
                                                                                                                                                                                                                                                                                                                                                                            similar to many, e.g. PSY2_LYCES P37273 phytoene synthase, precursor (310 aa) Fasta scores, opt: 421, z-score: 500.0,E(): 6.6e-21, (32.9% identity in 295 aa overlap); containsPS01045 Squalene and phytoene synthases signature 2"
                                                                                                    complement(2108.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(1736. .2644)
/gene="phyA"
/note="Rv3397c, (MTCY78.31), len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(1736./gene="phyA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RVVLDITSKPPATIEWE"
                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   33818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "guaA"
```

```
implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                               /organism="Mycobacterium
/strain="H37Rv"
/db_xref="taxon:1773"
/clone="Y78"
                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                               tuberculosis'
```

QGTLYPDVVESGGGSGTANIKSHHNVGGLPDDLKFTLVEPLRLLFKDEVRAVGRELGL PEEIVARQPFPGPGLGIRIVGEVTAKRLDTLRHADSIVREELTAAGLDNQIWQCPVVL LADVESVGVQGDGRTYGHPIVLRPVSSEDAMTADWTRVFYEVLERISTRITNEVAEVN /note="Ŕv3396c, (MTCY78.32), len: 525, guaA, gmp synthase, highly similar to Mycobacterium leprae U00015_15 GUAA_MYCLE P46810 gmp synthase (glutamine-hydrolyzing) (590 aa) Fasta scores, opt: 3000, z-score: 3351.4, E(): 0, (86.3% identity in 531 aa overlap); contains PS00442 Glutamine amidotransferases class-I active site" complement(1428. .1463) complement(147. .1724) complement(147. .1724) /gene="guaA"

/note="PS00442 Glutamine .2644) amidotransferases class-I active

/product="phya"
/product="CAB01026.1"
/protein_id="CAB01026.1"
/protein_id="CAB01026.1"
/db_xref="G1:1449390"
/db_xref="SWISS-PROT:050728"
/translation="WYESIEQAYRITESITRTAARNETYGIRLLPREKRAALSAVYALG
/translation="WYESIEQAYRITESITRTAARNETYGIRLLPREKRAALSAVYALG
/translation="KITELDAIRKSLUNIDDSSDPVLVALADAARREPVPIAMFAEL
IDGARMEIDWAGGELAPETKITELDAIRKSLUNIDDSSDPVLVALADAARREPVPIAMFAEL
IDGARMEIDWAGGELAPETKITLDAIRKSLUNIDDSSDPVLVALADAARREPVPIAMFAEL
INTERDVREDFLAGRIYLPRDELDRLGVRLRLDDTGALDDPDGRLAALLRESADRAAD
TNILRDVREDFLAGRIYLPRDELDRLGVRLRLDDTGALDDPDGRLAALLRESADRAAD

/note="PS01045 Squalene and phytoene synthases signature 2" AALASSVTCGPAHGPLPADLGSHPSH" WYSLGLRLIPHLDRRSAACCAAMSGIYRRQLALIRASPAVVYDRRISLSGLKKAQVAA 2185)

```
gene
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="Rv3398c, (MTCY78.30), len: 359, GGPP synthetase, most similar to AE000797_3 Methanobacterium thermoautotrop 026156 bifunctional short chain isoprenyl diphosphate synthase (325 aa) FASTA scores, opt: 605, z-score: 738.4, E(): 0, (37.1% identity in 329 aa overlap); homology suggests atg at 30121 or ttg at 30145 initiation codon; contains PS00444Polyprenyl synthetases signature 2"/rocodon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4885. .5673
/gene="Rv3400"
4885. .5673
                                                                                                                                                                                                                                                             /note="Rv3400, (MTCY78.28c), len: 262, possible BETA-PHOSPHOGLUCOMUTASE, similar toseveral, e.g. PGMB_BACSU PUTATIVEBETA-PHOSPHOGLUCOMUTASE (226 aa, E(): 1.5e-05, 33.9% identity in 245 aa overlap), also highly similar to U00015_17 Mycobacterium leprae cosmid B1620 Y09T_MYCLE (261 aa) Fastascore, opt: 1293, 7:score: 1478.0, E(): 0, (74.4% identityin262 aa overlap), also similar to MTCY39.11c (34.9% identityin 238 aa overlap); Rv3400 and Rv3401 are similar to beginning and end of MTCY39.11c with approx. 270aa missing fromthe middle"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="Rv3399" (MTCY78.29c), len: 348, unknown, simi/note="Rv3399" (MTCY78.29c), len: 348, unknown, simi/note="Rv3399" (MTCY31.21c (38.0% identity in 308 aa overlap), MTCY210_45, MTCY4C12_14, MTY13D12_21, MTCY210_45, MTCY210_44, MTCI5_19, MTCI5_20, MTV035_9, MTV043_22, MTCY31_23, MTY13D12_1, MTCY180_29 etc."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="manwyrrnypevrsrvlglpekvraclfdldgvltdtasihtka
wkamedaylaeraertgekfypedpaadyntydgkkredgvrsflssraieipdgsp
ddpgaaetyvglgnrkndmlhklleddgayyetgssryleavtaagleyavysssant
rdvlattgldreyqgrvdgvtlreehiagkpapdsflraaellgvtpdaaavfedals
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ELRLEDIGDHATGGRWMIDNIAIRTKFYDDFFGDATTAGIRQVVILAAGLDTRAYRLPWPPGTVVYEIDQPAVIKFKTRALANLNAEPNAERHAVAVDLRNDWPTALKNAGFDPARPTAFSAEGLLSYLPPQGQDRLLDAITALSAPDSRLATQSPLVLDLAEEDEKKNRMKSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="Rv3399"
3775. .4821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="PS00444 Polyprenyl synthetases
3775. .4821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APRSVREALVAYGRHIGLAFQLVDDLLGIWGRPEITGKPVYSDLRSRKKTLPVTWTVA
HGGSAGRRLAAWLVDETGSQTASDDELAAVAELIECGGGRRWASAEARRHVTQGIDMV
ARIGIPDRPAAELQDLAHYIVRQA"
  GVAAGRAGNFAVVVGINRTGRAAQAAQLRRHGADVVVTDLAELL"
5688. .8048
                                                                                                                                                       /transl_table=11
/product="hypothetical protein
/protein_id="CABO1023.1"
/db_xref="GI:1449387"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product "hypothetical protein /protein_id="CABQ1024.1" /protein_id="CABQ1024.1" /db_xref="GU:1449388" /db_xref="SWISS-PROT:Q50726"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4885. .5673
/gene="Rv3400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AEAWRERGFDLDLTELIYFDQRNDVADYLAGSGWQVTTSTGKELFAAQGLPPFADDHI
TRFADRRYISAVLK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="marpmgKlpsnTrkCaQCamaealLeIagqTInQKDLgrsgrmt
RTDNDTwDLaSSVGaTaTmIaTaralaSraenpLInDpfaepLvraVGIDLfTrlaSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Compt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AALRAISEATRELIRGQAADTAFESRTDVALDECLKMAEGKTAALMAASAEVGALLAG
                                                                                                                                       /db_xref="SWISS-PROT:Q50725"
                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="idsA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(2673. .3752)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .ement(3015. .3053)
                                                                                                                                                                                                         Rv3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rv3399"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     348, unknown, similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     signature
                                                             δÃ
                                                                                                                                                     ρy
                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                     Дb
                                                                                                            В
                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρŞ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
```

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 agcaagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaag
 23754
                                                                                                                                                                                                                                                         23994
                                                                                                                                                                                                                                                                                                                                                                                      24114
                                                                                                                                                                                                                                                                                                                                                                                                                                                     24174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          24414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24474
                                                                                                                             23874
                                                                                                                                                                                            23934
                                                                                                                                                                                                                                                                                                                        24054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                             661
                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                          601
                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                gtcaacgcgattcgcaagacgttgaaagcggtcgcggtccaaggggccgtacttcggtgac 840
GTCAACGCGATTCGCAAGACGTTGAAAGCGGTCGCGGTCAAGGGGGCCGTACTTCGGTGAC
                                                                               ggtaagccactactgatcgttggctgaagacgttggagggcgaagcgttggcgacgcttgttc
                                                                                                                                         caagacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacg
                                                                                                                                                                                                        ttcgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacac
                                                                                                                                                                                                                                                      gaagcgatgaacaaggtcggccacgacagcgtggtcaagcgtcaaggaatcctccacgctg
                                                                                                                                                                                                                                                                                                                                                                                    gccgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggcctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1600;
                                                                                                                             CAAGACAAGATCAGCTCGCTTCCCGATCTGTTGCCATTGCTGGAAAAGGTTGCAGGAAACG
                                                                                                                                                                                           TTCGTTACCGACTTCGATAACCAGCAGCGGGTGCTCGAGGACGCGTTGATCCTGCTGCAC
                                                                                                                                                                                                                                                                                                                       GAAGCGATGAGCAAGGTCGGCCACGACGCGTCGTCAGCGTCGAAGAATCCTCGACGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCCGCCGACGCGGTATCCGAGGCGCTGCTGGCATCGGCCACGCCGGTGTCCGGCAAGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGCCTGAGGCTAGTGGCCGCCGGCGTCAACCCGATCGCGCTCGGCGTGGGAATCGGCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GATGTGGCCGGTGACGGCACCACCACCGCAACCATCTTGGCGCAGGCACTGATCAAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="Rv3401"
5688. .8048
/gene="Rv3401"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tomany hypothetical proteins, e.g. YVDK_BACSU HYPOTHETICAL 88.3 KD PROTEIN, (757 aa, E(): 0, 28.7% identity in 752 aa overlap), also highly similar to U00015_18 M. leprae 6466952 B1620_F1_30 Q49736|Y09S_MYCLE (792 aa), FASTA scores, opt: 4820 z-score: 4655.8 E(): 0, (91.4% identity in 782 aa overlap), also similar to MTCY39.11c, (27.2% identity in 802aa overlap); RV3400 and RV3401 are similar to beginning and end of MTCY39.11c with approx. 270aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="Rv3401,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98.3%;
98.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 1589.8; DB 2; Pred. No. 1.4e-168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (MTCY78.27c), len: 786, unknown,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 33818;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            similar
                                                                                                                                                                                                                                                                                                                                                     540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24475
23695
                                                                                              780
                                                                                                                                                           720
                                                                                                                                                                                                                        660
                                                                                                                                                                                                                                                                                       600
                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60
                                                              23755
                                                                                                                             23815
                                                                                                                                                                                           23875
                                                                                                                                                                                                                                                        23935
                                                                                                                                                                                                                                                                                                                       23995
                                                                                                                                                                                                                                                                                                                                                                                    24055
                                                                                                                                                                                                                                                                                                                                                                                                                                                   24115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       24415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
```

```
REFERENCE
AUTHORS
                                            REFERENCE
AUTHORS
TITLE
JOURNAL
                                                                                                                               VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                  RESULT
MTGROEOP
LOCUS
                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                               ACCESSION
                                                                                                                                                                        DEFINITION
                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                         23094
                                                                                                                                                                                                                                                                                                                                                                   23154
                                                                                                                                                                                                                                                                                                                                                                                                                                                    23274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23634
                                                                                                                                                                                                                                                                                                                                                                                                            23214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23514
                                                                                                                                                                                                                                                                                                                                              1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  901
                                                                                                                                                                                                                                                                                                                        tcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtg
                                                                                                                                                                                                                                                                                                                                                                 gtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggac 1380
                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcgggatcgggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtg
Mycobacterium.

1 (bases 1 to 2987)
Shinnick,T.M.
Direct Submission
Submitted (26-SEP-1991) T.M. Sh
Malistop G35, Div of Bacterial
Road, N.E. Atlanta, GA 3033, U
2 (bases 1 to 2987)
Kong,T.H., Coates,A.R.M., Hickn
                                                                                                                                                                                                                                                                                                                                                                                                            GTGTTCTCCGAAGCCCTTGCCGCGCCGTTGTTCTTGGATCGCCGCCAACGCTGGCTTGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGCAAGGCGCTGACCGAACTGCGTGCGTCGCTGACCGGTGACGAGGTCCTCGGTGTCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTGGTCAGCAAGGACGACACGGTCATTGTCGACGGCGGCGGCACCGCAGAAGCGGTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGCCGTAAGGCGTTCCTTGAGGACCTGGCGGTGGTGACGGGTGGCCAGGTGGTCAACCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MTGROEOP 2987 bp DNA
M.tuberculosis groE gene for
X60350.1 GI:44599
Chaperonin; groE gene; groESL
Mycobacterium tuberculosis.
Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAGGCCGCGGTCGAGGAGGCCATCGTCCCTGGTGGGGGAGCCTCGCTCATCCACCAGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AACCGGGCGAAGCACTTGCGTGCCGAGATCGACAAGAGCGATTCGGATTGGGATCGGGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GACGCCGGCATGGTGCGCGCGAGGTGGGCTTGGAGGTGCTGGGCCTCGGCCCGACGCGTG
                                                                                              Bacteria; Firmicutes;
Actinomycetales; Coryn
                                                                                               Corynebacterineae;
              _, ı.M. Shinnick, (
if Bacterial and Mycot
GA 30333, USA
                                                                                               Actinobacteria; Actinobacteridae; nebacterineae; Mycobacteriaceae;
                                                                                                                                          groESL
                                                                                                                                                                        DNA
e for
   Hickman, C.
                                                                                                                                                                        KCS
                                                                                                                                         operon;
                                                                                                                                                                        and
                                Mycotic Diseases, 1600
   ij.
                                                                                                                                                                        BCT
10-kDa
                                                                                                                                         heat
   and
                                                                                                                                          shock
   Shinnick, T.M
                                                                                                                                                                        products
                                                                                                                                         protein
                                                                                                                                                                                                                                                           1617
                                 Clifton
                                                                                                                                                                                                                                                                                                   1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1080
                                                                                                                                                                                                                                                                                                                                                                  23095
                                                                                                                                                                                                                                                                                                                                                                                      1440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  960
                                                                                                                                                                                                                                                                                                                        23035
                                                                                                                                                                                                                                                                                                                                                                                                           23155
                                                                                                                                                                                                                                                                                                                                                                                                                                                    23215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                23395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            900
                                                                                                                                                                                                                                                                                22975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       23635
                             Ωy
                                                     DЬ
                                                                      Qy
                                                                                               DЬ
                                                                                                              Qy
                                                                                                                                         DЬ
                                                                                                                                                           Qy
                                                                                                                                                                                  DЬ
                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RBS
CDS
```

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -35_signal
-10_signal
1054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     terminator
                                                                                                                                      934
                                301
                                                                  994
                                                                                                  241
                                                                                                                                                                      181
                                                                                                                                                                                                          874
                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                             754
                                                                                                                                                                                                                                                                                                           61
                                                                agcaagctgatcgaatacgaacgaaaccgcgcgtcgtcgccatggaggttcggcatggacaag
                                                                                                                                                                                                                                                                                                                                                                                                                 1599;
                 ggcctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgttgggaatcggcaag
                                                                                                                                                                                                                                                                          CTGGCCGACACCGTGCGGGTGACGCTGGGGGCCGCGGCGGCCATGTGGTGCTGGCCAAG
                                                                                                                                                                                                                                                                                                                                               AGCAAGCTGATCGAATACGACGAAACCGCGCGTCGCGCCATGGAGGTCGGCATGGACAAG
GGCCTGAGGCTAGTGGCCGCCGGCGTCAACCCGATCGCGCTCGGCGTGGGAATCGGCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
//transl_table=11
/product="RCS"
/product="RCS"
/product="RCS"
/protein_id="CAA42909.1"
/db_xref="GI:44601"
/db_xref="GI:44601"
/db_xref="MSKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFG
/CTASSLAtion="MSKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFG
GPTVTNDGVTVAREIELEDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGG
LRLVAAGVNPIALGVGIGKAADAVSEAALLASATFVSGKTGIAQVATVSSRDEQIGDLV
GEAMSKVGHDGVVSVEBSSTLCTFELETFEGIGPDKGFLSAYFVTPDFUQQAVLEDALI
LLHQDKISSLPDLLPLLEKVAGTGKPLLIVAEDVEGLALASAFFVDVSKDDTVIVDG
PYFGDRRKAFLEDLAVVTGGQVVNRDAGMVLREVGLEVLGSARRVVVSKDDTVIVDG
GTAEAVANRAKHLRAEIDKSDSDWDREKLGERLAKLAGGVAVIKVGAATETALKERKE
SVEDAVAAAKAAVEEGIYPGGGASLIHQARKALTELRASLTGDEVLGVDVFSEALAAP
LFWIAANAGLDGSVVVKKVSELPAGHGLNVNTLSYGDLAADGVIDPVKVTRSAVLNAS
SVARMVLTTETTVVDKPAKAEDHDHHHGHAH"
                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
/transl_table=11
/product="10-kDa antigen h
/protein_id="cAA42908.1"
/db_xref="GI:581363"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="SWISS-PROT:P09621"
/translation="MAKVNIKPLEDKILVQANEAETTTASGLV1PDTAKEKPQEGTVV
AVGPGRWDEDGEKR1PLDVAEGDTV1YSKYGGTEIKYNGEEYLILSARDVLAVVSK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /clone_lib="gtl1: M.tuberculosis"
/clone="pRL4, lambda SK34"
143. .150
162. .175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /db_xref="taxon:1773"
/cell_line="E.coli XL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /strain="Erdman'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     892
                                                                                                                                                                                                                                                                                                                                                                                                                               98.2%;
98.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .2419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1048
                                                                                                                                                                                                                                                                                                                                                                                                               Score 1588.2;
Pred. No. 6.6e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                               e 1588.2; DB 2;
. No. 6.6e-168;
ismatches 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             XL-1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              groE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   homologue"
                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                     2987;
                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                       873
                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                               813
                                                                                                                                                                                                                                                                                                                                                                               60
                                                                    1053
                                                                                                                                        993
                                                                                                                                                                      240
                                                                                                                                                                                                          933
                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

```
В
                                                                                                                                                                           В
                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
 δõ
                  Вb
                                    δõ
                                                        밁
                                                                          Š
                                                                                              В
                                                                                                             Qy
                                                                                                                                     밁
                                                                                                                                                   Qy
                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δō
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
  1441
                    2134
                                                                                                                                                                                                                                                        1774
                                       1381
                                                           2074
                                                                             1321
                                                                                                2014
                                                                                                                   1261
                                                                                                                                      1954
                                                                                                                                                        1201
                                                                                                                                                                            1894
                                                                                                                                                                                               1141
                                                                                                                                                                                                                  1834
                                                                                                                                                                                                                                   1081
                                                                                                                                                                                                                                                                          1021
                                                                                                                                                                                                                                                                                             1714
                                                                                                                                                                                                                                                                                                                                    1654
                                                                                                                                                                                                                                                                                                                                                                          1594
                                                                                                                                                                                                                                                                                                                                                                                                                                                     1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1114
                                                                                                                                                                                                                                                                                                                                                                                                                1534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1294
                                                                                                                                                                                                                                                                                                                961
                                                                                                                                                                                                                                                                                                                                                       901
                                                                                                                                                                                                                                                                                                                                                                                           841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    601
                                                                                                                                                                                                                                                                                                                                                                                                                                  781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caagacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacg
                                                        gtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggac
                                                                                             cgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgac
                                                                                                                                    accctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactagg
                             ggctcggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtgaac
                                                                                                                                                                           GCCACCGAGACCGCACTCAAGGAGCGCAAGGAAAGCGTCGAGGATGCGGTCGCGGCCGCC
                                                                                                                                                                                     gccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgggccgcc
                                                                                                                                                                                                                                                                aaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgggaa
                                                                                                                                                                                                                                                                                                       9t99tcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggttggcc 1020
                                                                                                                                                                                                                                                                                                                                                                        gtcaacgcgattcgcaagacgttgaaagcggtcgggtcaaggggccgtacttcggtgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                  ttcgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggcaccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGCTCGGTGGTGAAGAAGGTCAGCGAGCTACCCGGCGGGCATGGGCTGAACGTGAAC
                                                                                                                                                                                                                                                       AACCGGGCGAAGCACTTGCGTGCCGAGATCGACAAGAGCGATTCGGATTGGGATCGGGAA
                                                                                                                                                                                                                                                                                             GTGGTCAGCAAGGACGACACGGTCATTGTCGACGGCGGCACCGCAGAAGCGGTGGCC
                                                                                                                                                                                                                                                                                                                                   GACGCCGGCATGGTGCTGCGCGAGGTGGGCTTGGAGGTGCTGGGCCTCGGCCCGACGCGTG
                                                                                                                                                                                                                                                                                                                                             gacgccggcattgtgctgcgcgaggtggggcttggaggtgctggggctcggcccgacgcgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTCGTTACCGACTTCGATAACCAGCAGCGGCGGTGCTCGAGGACGCGTTGATCCTGCTGCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGCACCGAGTTGGAGTTCACCGAGGGTATCGGCTTCGACAAGGGCTTCTTGTCGGCATAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAAGCGATGAGCAAGGTCGGCCACGACGGCGTGGTCAGCGTCGAAGAATCCTCGACGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gaagcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctg
                                                                                                                                                                                                                 1260
                                                                                                                                                                                              1200
                   2193
                                     1440
                                                        2133
                                                                             1380
                                                                                                                                     2013
                                                                                                                                                                           1953
                                                                                                                                                                                                                 1893
                                                                                                                                                                                                                                  1140
                                                                                                                                                                                                                                                       1833
                                                                                                                                                                                                                                                                                             1773
                                                                                                                                                                                                                                                                                                                                   1713
                                                                                                                                                                                                                                                                                                                                                      960
                                                                                                                                                                                                                                                                                                                                                                        1653
                                                                                                                                                                                                                                                                                                                                                                                                               1593
                                                                                                                                                                                                                                                                                                                                                                                                                                840
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                               2073
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1173
```

```
MEDLINE
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
MLGROE1D
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
                                                                                                                                                                                CDS
                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1561
                                                                                                                                                                                                                                                RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                            -10_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -35_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TCGGCGGTGTTGAACGCGTCATCGGTTGCCCGGATGGTACTCACCACCGAGACGGTCGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   groEL gene; groES gene
Mycobacterium leprae
Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (28-JAN-1992) Rinke
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mycobacteria contain two groEL genes: the second Mycobacterium leprae groEL gene is arranged in an operon with groES mol. microbiol. 6 (14), 1995-2007 (1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 (bases 1 to 2912)
Rinke de Wit, T.F., Bekelie, S., Osland, A., Miko, T.L., Hermans, P.W., van Soolingen, D., Drijfhout, J.W., Schoningh, R., Janson, A.A. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         211665.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium
Z11665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Institut
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rinke de Wit, T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           92374850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Thole, J.E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MLGROE1D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 2912)
                                                                                                                           /gene="groEL"
/codon_start=1
/transl_table=11
                                                                                                                                                                                                              /gene=
853. .
             /PIOLEIN_Id="CAB62574.1"
//PIOLEIN_Id="CAB62574.1"
//db_xref="GI:6562688"
//translation="MSKLIEYDETARHAMEVGMNKLADTVRVTLGPRGRHVVLAKAFG
//translation="MSKLIEYDETARHAMEVGMNKLADTVRVTLGPRGRHVVLAKAFG
GPTITNDGVTVAREIDLEDPENLGAQLVKSVATKTNDVAGDGTTTATVLAQALVKGG
GPTITNDGVTVALGACISKAADAVSEALLAVATPVAGKDAITQVATVSSRDEQIGALV
GEGMNKVGTDGVVSVEESSTLDTELEFTEGVGFDKGFLSAYFVTDFDSQQAVLDDPLV
LLHQEKISSLPELLFMLEKYTESGKPLLIVAEDLEGEALATLVVNSIRKTLKAVAVKS
                                                                                                                                                                            /gene="groEL"
862. .2475
                                                                                                                                                                                                                                             /protein_id="CAB63917.1"
/db_xref="G1:6624972"
/translation="MAKVKIKPLEDKILVQAGEAETMTPSGLVIPENAKEKPQEGTVV
AVGPGRWDEDGAKRIPVDVSEGDIVIYSKYGGTEIKYNGEEYLILSARDVLAVVSK"
853...857
                                                                                                                                                                                                                                                                                                                                                                             /gene="481..7
                                                                                                                                                                                                                                                                                                                                                                                                          /gene="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (AHRI) Addis
PFFGDRRKAFLEDLAIVTGGQVVNPETGLVLREVGTDVLGSARRVVVSKDDTIIVDGG
                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="groES"
261. .266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="groES"
238. .243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref="taxon:1769"
238. .783
                                                                                                                                                                                                                                                                                                                            /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                            /gene="groES"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GI:44408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             . .2912
                                                                                                                                                                                                         ne="groEL"
. .2475
                                                                                                                                                                                                                                                                                                                                                                          ne="groES"
. .783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2912
                                                                                                                                                                                                                                                                                                                                                                                                            e="groES"
.371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ďď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      groES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ababa,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ethiopia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         de Wit T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Schoningh, R., Janson, A.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Armauer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hansen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20-DEC-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Research
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2313
```

```
. · ·
                                       밁
                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Ma
Best Loc
Matches
                                         1705
                                                                                                                                                                                                                                                                                          1405
                                                                                                                                                                                                                                                                                                                                          1345
                                                                                                                                                                                                                                                                                                                                                                                                                                         1225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COUNT
                                                                                         1645
                                                                                                                                                                                          1525
                                                                                                                                                                                                                                                                                                                                                                                         1285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1045
                                                                                                                                                                                                                                         1465
                                                                                                                 781
                                                                                                                                                                721
                                                                                                                                                                                                                 661
                                                                                                                                                                                                                                                                 601
                                                                                                                                                                                                                                                                                                                541
                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        865
                901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Н
                                                                                       gacgccggcattgtgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtg
                                                                                                                                         GGCAAGCCGCTGCTGATCGTCGCCGAAGACCTCGAGGGTGAAGCATTGGCGACGCTTGTC
                                                                                                                                                     ggtaagccactactgatcgtggctgaagacgtggaaggcgaagcgttggcgacgctggtc
                                                                                                                                                                                          CAGGAGAAGATCAGCTCGCCTGAGTTGCTGCCGATGCTCGAGAAGGTCACTGAGTCA
                                                                                                                                                                                                     caagacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacg
                                                                                                                                                                                                                                                      ttcgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacac
                                                                                                                                                                                                                                                                                          GACACCGAGCTAGAGTTCACCGAGGGCGTCGGCTTCGACAAAGGTTTCCTGTCGGCGTAT
                                                                                                                                                                                                                                                                                                     ggcaccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatac
                                                                                                                                                                                                                                                                                                                                          GAGGGGATGAACAAGGTCGGCACTGACGGCGTTGTCAGCGTTGAAGAGTCGTCGACGCTG
                                                                                                                                                                                                                                                                                                                                                     GCCGCCGACGCGGTGTCCGAGGCACTGCTGGCGGTAGCAACCCCGGTGGCCGGCAAGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGCCTGCGCATGGTCGCCGGGGGCCAACCCGGTCGCCCTAGGTGCTGGCATCAGCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggcctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GACGTCGCTGGCGACGGCACTACCACCGCGACCGTGTTGGCCCAGGCGCTGGTCAAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAGGACCCGTTCGAAAATCTGGGCGCTCAGCTGGTGAAGTCGGTGGCCACCAAGACCAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gaagatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCATTCGGCGGGCCCACCATCACCAACGACGGTGTCACCGTCGCGCGTGAGATCGACCTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gcgtttggcggacccacggttaccaacgacggcgtcacggtggcacgttgagatcgagctg
                                                                                                                                                                                                                                        TTCGTGACCGACTTCGACTCGCAGCAGGCTGTGCTCGACGATCCGCTGGTCCTGCTGCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSNDAVAKRVNQLRAEIEVSDSEWDREKLQERVAKLAGGVAVIKVGAVTETALKKRKE
SYEDAVAAAKASIEEGIIAGGGSALVQCGAALKQLRTSLTGDEALGIDVFFEALKAPL
YHIATNAGLDGAVVVDKVSGLPAGHGLNASTLGYGDLVADGVVDPVKVTRSAVLNAAS
VARMMLTTETAVVDKPAKTEEHNHHGHAH
861 c 982 g 502 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   66.48;
79.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 1074.2; DB 2;
Pred. No. 5.9e-111;
0; Mismatches 318;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                        1704
                                                                                                                                         1644
                                                                                                                                                                                          1584
                                                                                                                                                                                                                                        1524
                                                                                                                                                                                                                                                                                          1464
                                                                                                                                                                                                                                                                                                                                         1404
                                                                                                                                                                                                                                                                                                                                                                                        1344
                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                                                                                                                                        1284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                              900
                                                                                                                 840
                                                                                                                                                                780
                                                                                                                                                                                                                720
                                                                                                                                                                                                                                                                 660
                                                                                                                                                                                                                                                                                                                 600
                                                                                                                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1;
```

δÃ

В

Ş

20 밁 δÃ В δÃ Дb ΔÃ Q

Вb

В

δÃ

Ωy

Qy

γQ

δõ

В

```
REFERENCE
AUTHORS
JOURNAL
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                            RESULT
U00020/c
LOCUS
                                                                                                                                                                                                                              KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                    DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                         VERSION
                                                                JOURNAL
MEDLINE
                                                                                                        TITLE
                                                                                                                                                AUTHORS
                                                                                                                                                                                                                 ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2182
                                                                                                                                                                                                                                                                                                                                                               2422
                                                                                                                                                                                                                                                                                                                                                                                                                  2362
                                                                                                                                                                                                                                                                                                                                                                                                                                          1501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       961
            2 (bases 1 to : Smith,D.R.
Unpublished
3 (haser
                                                                                                                                                                                                                                                                                                                                                             cgcaaggcgctgaccgaactgcgttgcgtcgctgaccggtgacgaggtcctcggtgtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtg 1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  accctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggctcggtggtcggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtgaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aaggccgcggtcgagggaggcatcgtccctggtgggggagcctcgctcatccaccaggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcgggatcgggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAAACCGGCCTGGTGCTGCGCGAGGTGGGCACTGACGTGCTGGGCTCGGCCCGCCGTGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGCGCGGTGGTCGACAAGGTTAGCGGGCTGCCCGCCGGGCACGGACTGAATGCTAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTATTTTTCGAGGCGCTCAAGGCACCGCTTTACTGGATTGCCACTAACGCCGGGTTGGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAGGCGTCTATCGAGGAGGGTATCATCGCGGGTGGTGGATCGGCGCTCGTCC---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTCACCGAGACGGCGCTGAAGAAACGCAAGGAAAGCGTCGAAGACGCCGTCGCGGCTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAGCGAGTCAATCAGCTGCGGGCCGAGATAGAGGTCAGCGACTCAGAATGGGATCGCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                  TCAGCGGTGCTTAACGCGGCCTCGGTGGCGCGGATGATGCTCACCACCGAAACGGCGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACGCTGGGCTATGGCGATTTGGTCGCCGATGGTGTCGTCGACCCGGTCAAGGTCACCAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAGCTGCAGGAGCGCGTGGCCAAACTGGCCGGTGGCCGTCGTCATCAAGGTGGGGGCCT
                                                                                ŏ
                                                                                                          Mycobacteria contain two GroEl
                                                                                                                   Hermans, P.W.M., van Soolingen, D., Janson, A.A.M. and Thole, E.R.
                                                                                                                                               1 (bases 1622 to 4514)
Rinke de Wit, T.F., Bekelie, S.,
                                                                                                                                                                                      Mycobacterium leprae.
Mycobacterium leprae
Mycobacterii; Actinobacterida
Bacteria; Firmicuttes; Actinobacteria; Actinobacterida
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                        U00020.1
                                                                                                                                                                                                                                                                      Mycobacterium U00020
                                                                                                                                                                                                                                                                                              U00020
                                                                                                                                                                           Mycobacterium
                                                                                            Leprae
 (bases
bison,K.
                                                                                Microbiol.
                                                                                GroEL gene is arranged in an operon icrobiol. 6, 1995-2007 (1992)
                                                                                                                                                                                                                                                                                              36947
                                                                                                                                                                                                                                                                               36947 bp
1 leprae
               36947)
                                                                                                                                                                                                                                                                                  DNA
cosmid
                                                                                                                                                                                                                                                                                  в229
                                                                                                          genes.
                                                                                                                                              Osland,
                                                                                                                                 land, A., Miko, T.L.,
Drijfhout, J.W., Sc
                                                                                                                                                                                                   Actinobacteridae
                                                                                                                                                                                                                                                                                                                                                                                       1599
                                                                                                                                                                                                                                                                                                                                                               2460
                                                                                                          second Mycobacterium
                                                                                                                                                                                                                                                                                                01-MAR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -AGTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1944
```

CDS

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JOURNAL
                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (01-MAR-1994) Department of Genetics, Harvard Medical School, 200 Longwood Avenue, Boston MA 02115
On Mar 31, 1994 this sequence version replaced gi:414226.
This sequence data was produced by the Genome Sequencing Center located at Collaborative Research Incorporated (1365 Main St., Waltham MA, 02159). 617-487-7979). Please contact Doug Smith (smith@cr.cric.com). The annotation should be considered
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (01-NOV-1993) Department of Genetics, Harvard Medical School, 200 Longwood Avenue, Boston MA 02115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           preliminary and incomplete.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Robison, K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (bases
                                                                  complement(4517. .5389)
/note="Probable glycoproteinase (similarity to Pasteurella /note="probable glycoproteinase Al and E.coli ygjC);
                                                                                                                                                                                                                                                                                                                                                                                           complement(3751. .4053)
/note="10 kd chaperonin; B229_C3_247"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSNDAVAKRVNOLRAEIEVSDSEWDREKLQERVAKLAGGVAVIKVGAVTETALKKRKE
SVEDAVAAAKASIEEGIIAGGGSALVQCGAALKOLRTSLTGDEALGIDVFFEALKAPL
YWIATNAGLDGAVVVDKVSGLFAGHGLNASTLGYGDLVADGVVDPVKVTRSAVLNAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GEGMNKVGTDGVVSVEESSTLDTELEFTEGVGFDKGFLSAYFVTDFDSQQAVLDDPLV
LLHQEKISSLPELLPMLEKVTESGKPLLIVAEDLEGEALATLVVNSIRKTLKAVAVKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="msklieydetarhamevgmnkladtvrvtlgprgrhvvlakafg
GPTITNDGVTVAREIDLEDPFENLGAQLVKSVATKTNDVAGDGTTTATVLAQALVKGG
LRMVAAGANFVALGAGISKAADAVSEALLAVATPVAGKDAITQVATVSSRDEQIGALV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="groE1"
/protein_id="AAA17312.1"
/db_xref="GI:467130"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="whitB"
/protein_id="AAA17313.1"
/protein_id="AAA17313.1"
/db_xref="GI:467131"
/translation="MPOPKQLPGPNATIWNWQLQGLCRGVDSSMFFHPDGERGRARMQ
/translation="MPOPKQLPGPNATIWNWQLQGLSESERDLLLKGDLARSRSIPRSA
"REQRAKEMCRRCPVIEECRAHALDVGEPYGVWGGLSESERDLLLKGDLARSRSIPRSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="Probable transcription factor (similarity
Streptomyces coelicolor whiB); B229_F1_2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="mtsysivveightsaaepmlaaaafgnqpgrwplptattphqlw
LRAVAAGGQGHYSSAYRDLAVLRRSVPAGRLASLAHSTHGSFLRQLGWHSLARGWDGR
ALVLAGTDSEARADALIGLAADALGVGRLAAAATLLRRVGSALAPAQLPAQVADRLAV
RRRWVAAELAMAVGDGATAVRHAREAVELAQVGRVVSYRHQVKSDVVLAAALCSAATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARMMLTTETAVVDKPAKTEEHDHHGHAH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement (2059.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="B229_C1_175"
/protein_id="AAA17292.1"
/db_xref="GI:467110"
                                                            hemolytica glycoproteinase
B229_C3_246"
                                                                                                                                                                            /translation="makvkikpleDkilvQageAeTmTpSGLvipenAkekpQeGTvV
aVGPGRWDEDGAkRIPvDvSeGDIvIySkYGGTEIKYNGEEYLILSARDvLavvSk"
                                                                                                                                                                                                                                                                                                 /transl_table=11
/product="chpA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PFFGDRRKAFLEDLAIVTGGQVVNPETGLVLREVGTDVLGSARRVVVSKDDTIIVDGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="GroE1 protein; B229_C3_248"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RARVVAEAALAATGRLGLIPLRWALACLLIDIGSVTFSEPELSELP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
1. .36947
/codon_start=1
/transl_table=11
                                                                                                                                                                                                                                        /protein_id="AAA17311.1"
/db_xref="GI:467129"
                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /db_xref="taxon:1769"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   00 Longwood Avenue,
1 to 36947)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Mycobacterium leprae"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .791)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .3672)
```

```
/protein_id="AAA17300.1"
/db_xref="GI:467118"
/db_xref="GI:467118"
/tanslation="MAEYSLRSGAVICERVEDTVALGSRLGEQLRAGDVVVLSGPLGA
KTRINSATION="MAEYSLRSGAVICERVEDTVALGSRLGEQLRAGDVVVLSGPLGA
GKTVLAKGIAVAMDVDGPVISPTYVLARVHLPRRLGTPAMIHVDVYRLLDHRDADLVG
ELDSLDLDTDLAEAVVVMEWGAGLAECLAARHLDIRLERVRYSDVRIATWQWVCSRDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(6462. .6947)
/note="match to 16.9 kd E.coli protein in amiB region (yjeE); B229_C2_205"
/translation="MLLFRCVSTRCRHFPRTNGACRSTRVDYGAQLYLMHEVVGAVVS
AGLELIQGSPESPSQTTMRSTDTSVASSGTVIGGHLPTECPEFVEEIELGVPTVSNEQ
GGIPPGWPCGV"
                                                                                                                                                                                                                                                                                                                                                                                                   ADAYGHGATQVALAALAAGAAELGVATVDEALALRADGISAPVLAWLHPPGIDFGPAL
LADVQIAVSSVRQLDELLDAVRRTGRTATVTVKADTGLNRNGVVTDQYPAMLTALQRA
VVEDAVRLRGLMSHLVYADQPDNPSNDVQGKRFAALLAQAHEQGLRFEVAHLSNSSAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(7931. .9097)
/EC_number="5.1.1.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GQDLRTVLQTVTPHGMIVLVGHSMEGILKSPALEAVRLTSRSASKLMHRGSIASQSLI
GPILRAASYSDLRVSRGLDAFSQRIMNDTLIAILVSFLHALELHEETAGLWPLLRVPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(6940. .8001)
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AIGVRTTGDTLVVTDARRHEVYWARY RDGVRIAGPAVGSPTDVDPGTALTVAGSPEHA
ALFGLPLCEPIY PTPAGLVAAVPDWSVSPIPLVALYLRRPDAKPITADNEPIV I GTLT
PADVDRCAQLESQFFDGDNPWPAAAFDRELANSYNCYVGARTADTLVGY AGITRLGHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(5386. .6465
/EC_number="2.3.1.128"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VDEQAREGGVVPETASRAHLEALGPTTRCALAAAGLTGSAKPDVVAATTGPGLAGALL
VGVAAAKAYSAAWGVPEYAVNHLGGHLAADVYEHGPLPECVALLVSGGHTHLLQVRSL
GAPTVELGSTVDDAAGEAYDKVARLLGLGYPGGKVLDDLARTGDRDATVFPRGMTGPA
                                                                                                /product="B229_F3_101"
/protein_id="AAA17320.1"
/db_xref="GI:467138"
                                                                                                                                                                                                                                                                                                                                  MSRPDLAYDLVRPGTAVYGLSPVPSRGDMGLTPAMTVKCAVAMVKSTRAGEGVSYGHD
WTAQHDTNLALLPVGYADGVFRSLGGRLDVLTNGKRRPGVGRTCMDQFVVDLGPGPTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /protein_id="AAA17309.1"
/db_xref="GI:467127"
/translation="MAVTPISLRPGVLAEAVVDLGAIDYNVRVLREHAGMAQLMVVLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
/product="alr"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LIACGDHDLLTSDERSRGMAAVLPLLALVIVSGASRLALLDKPGAINDGLVRLVNRAV
PGKAALRYRRFKERLQRHG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VATTVGALSLRSTFERDNACRDPYVDRDFEKLGDERRCWVTTSGGMALVVREEGAVKA
PVAMVFAYGFYLRMDSFHFQRKRFGKRWGPQVRMVFYDHCGHVQSSEVALDTYTLTQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MSIVLAIDTATAAVTAGIVAFDGHDCFTLAERVTVDAKAHVERL
TPNVLVALADAELAMCELDAVVVGCGPGPFTGLRVGMATAANYGHALGIPVHGVCSLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
/product="rim"
/protein_id="AAA17291.1"
/db_xref="GI:467109"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acetyltransferase;
                                                                                                                                                                                              /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                      VAEGDEAILFGPGARGEPTAQDWADLLGTIHYEVVTSLRGRITRTYREAQTVDR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="Alanine racemase; B229_C3_243"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /trans1_table=11
/product="B229_C1_169"
/protein_id="AAA17290.1"
/db_xref="GI:467108"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="u229f"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ERIGLRPRYYPASGADAYLMRREAQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPFEYEVHTIAVDPAYRGRGVGRRLLGELLDFAGSGAIYLEVRTDNETAIALYRSVGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="30S Ribosomal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LIVGGVAANSRCAS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DDLNAFSFSGLKTAVARYVESHPDALPADVAAGFQEAVADVLTMKAVRAATGLGVSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /protein_id="AAA17310.1"
/db_xref="GI:467128"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                translation="MKWSPVYAGGSPERTARPKPLTDDEIRRRRNGRPWLAGGTGLVP/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               translation-"MTISAVPGTILAIETSCDETGVGIACLDDYGTVTLLADEVASS/
                                                                                                                                                                                                                                                                   .9446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .6465)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    er protein S18 alanine B229_C1_170"
```

CDS

CDS

CDS

CDS

. . · · ·

```
Query Match
Best Local S
Matches 1278
                                                                                                                                                                    3309
                                                                                                                                                                                                                                      3369
                                                                                                                                                                                                                                                                                                    3429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3609
                                                                                                                                                                                                                                                                                                                                                                      3489
                                                                                                                                                                                                                                                                                                                                                                                                                                        3549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
   541
                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
nes 1278; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <u>_</u>
                                                                                                                    gccgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagacc
                                                                                                                                                                                                                                                     ggcctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaag
                                                                                                                                                                                                                                                                                                    ctggccgacaccgtgcgggtgacgctggggccgccgcggcatgtggtgctggccaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         agcaagctgatcgaatacgaacgaaaccgcgcgtcgcgccatggaggtcggcatggacaag
                                                     gaagcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctg
ggcaccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatac
                                  GAGGGGATGAACAAGGTCGGCACTGACGGCGTTGTCAGCGTTGAAGAGTCGTCGACGCTG
                                                                                                  GCCATCACGCAGGTTGCGACGGTTTCTTCGCGCGACGAGCAGATCGGTGCGCTGGTCGGC
                                                                                                                                                                    GCCGCCGACGCGTGTCCGAGGCACTGCTGGCGGTAGCAACCCCGGTGGCCGGCAAGGAC
                                                                                                                                                                                                                                      GGCCTGCGCATGGTCGCCGGGGGCCAACCCGGTCGCCCTAGGTGCTGGCATCAGCAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGCAAGCTGATTGAGTACGACGAAAACCGCGCGTCATGCCATGGAGGTGGGCATGAACAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /trans_table=11
/product="gadB"
/product="gadB"
/protein_id="AAA17288.1"
/protein_id="AAA17288.1"
/db_xref="Gi:467106"
/translation="MAETFDKTCLDKDEYPAAAPSNGAAYSMATGLYSRLGTQLRQPV
/translation="MAETFDKTCLDKDEYPAAAPSNGAAYSMATGLYSRLGTQLRQPV
/TYPISAPENGGDAGLPGHKIALVCGS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(10120. .10344)
/EC_number="4.1.1.15"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="MSWPSLSATFTGELEPVAELCVALDKLAADNGLDIAVSVGAASG
GSGCLACTRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(9787. .9951)
/EC_number="4.1.1.15"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(9627. .9785)
/EC_number="4.11.1.15"
/EC_flutamate decarboxylase
/codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(10680. .11858)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="gadC"
/protein_id="AAA17289.1"
/db_xref="GI:467107"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VNYLGGDM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="gadD"
/protein_id="AAA17299
/db_xref="GI:467117"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Glutamate decarboxylase
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Glutamate decarboxylase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              translation="MGFLAAPSDVDQCKVAINMGSPYPGVGFGVWRGNEYLPEDVVFR/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66.4%;
79.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1074.2; DB 73; Pred. No. 1.7e-111; 0; Mismatches 318;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            isozyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             isozyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              isozyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B229_C1_166'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B229_C1_167'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B229_C2_202'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           36947;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ω
;-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                  3190
                                                                                                                                                                  3250
                                                                                                                                                                                                                                    3310
                                                                                                                                                                                                                                                                                                    3370
                                                                                                                                                                                                                                                                                                                                                                    3430
                                                                                                                                                                                                                                                                                                                                                                                                                                      3490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3610
 600
                                                                                                                                   480
                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ۲.
```

Qy

맑

δÃ

δ 밁 Qy Ф Q В Qy

Ş В δ

В

밁 δÕ 밁

ДЪ

```
Qy
                                            В
                                                              Q
                                                                                     Ъ
                                                                                                         Ş
                                                                                                                                В
                                                                                                                                                 δÃ
                                                                                                                                                                          В
                                                                                                                                                                                             Q
                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                            Ω
                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                           1441
                                                                                                                                                      1381
                                                                                                                                                                                                                                                                                                                               1141
  2112
                                                                1501
                                                                                     2232
                                                                                                                                 2292
                                                                                                                                                                                                                      2412
                                                                                                                                                                                                                                         1261
                                                                                                                                                                                                                                                                                                           2529
                                                                                                                                                                                                                                                                                                                                                     2589
                                                                                                                                                                                                                                                                                                                                                                                                2649
                                                                                                                                                                                                                                                                                                                                                                                                                    1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2769
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3069
                                                                                                                                                                                                                                                                                    1201
                                                                                                                                                                                                                                                                                                                                                                          1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2829
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3009
                                                                                                                                                                                                                                                                                                                                                                                                                                                              961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           781
ggtaagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtc
                                                       tcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtg
                                                                                                                                GGCGCGGTGGTCGACAAGGTTAGCGGGCTGCCCGCCGGGCACGGACTGAATGCTAGC
                                                                                                                                          GTATTTTTCGAGGCGCTCAAGGCACCGCTTTACTGGATTGCCACTAACGCCGGGTTGGAT
                                                                                                                                                                                     gtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggac
                                                                                                                                                                                                                     GCGCGGCGCTCAAGCAATTGCGTACGTCGCTGACCGGGAGACGAAGCCCTCGGCATCGAC
                                                                                                                                                                                                                                cgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgac
                                                                                                                                                                                                                                                                          aaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcc
                                                                                                                                                                                                                                                                                                                     gccaccgacaccgccctcaaggagcgcaaggaaagcgtcgaggatgcggtcgcgcc
                                                                                                                                                                                                                                                                                                                                                                                                          aaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcgggattcgggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                         GTGGTTAGTAAGGACGACACGATCATCGTCGACGGCGGCGGTTCCAACGACGCGGTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                  gtggtcagcaaggacgacaggtcattgtcgacggcggcggcaccgcagaagcggtggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggtgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAGGAGAAGATCAGCTCGCTGCCTGAGTTGCTGCCGATGCTCGAGAAGGTCACTGAGTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      caagacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TCAGCGGTGCTTAACGCGGCCTCGGTGGCGCGGATGATGCTCACCACCGAAACGGCGGTG
                                                                                                                                                                                                                                                                AAGGCGTCTATCGAGGAGGGTATCATCGCGGGTGGTGGATCGGCGCTCGTCC---AGTGC
                                                                                                                                                                                                                                                                                                           GTCACCGAGACGGCGCTGAAGAAACGCAAGGAAAGCGTCGAAGACGCCGTCGCGGCTGCG
                                                                                                                                                                                                                                                                                                                                                                                                AAGCGAGTCAATCAGCTGCGGGCCGACATAGAGGTCAGCGACTCAGAATGGGATCGCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTTAACTCGATCCGCAAGACGCTCAAGGCGGTTGCGGTTAAGTCCCCGTTCTTCGGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGCAAGCCGCTGCTGATCGTCGCCGAAGACCTCGAGGGTGAAGCATTGGCGACGCTTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTCGTGACCGACTTCGACTCGCAGCAGGCTGTGCTCGACGATCCGCTGGTCCTGCTGCAC
                                                                                      2173
                                             2113
                                                                  1560
                                                                                                           1500
                                                                                                                                 2233
                                                                                                                                                      1440
                                                                                                                                                                            2293
                                                                                                                                                                                                                      2353
                                                                                                                                                                                                                                          1320
                                                                                                                                                                                                                                                                2413
                                                                                                                                                                                                                                                                                     1260
                                                                                                                                                                                                                                                                                                           2470
                                                                                                                                                                                                                                                                                                                               1200
                                                                                                                                                                                                                                                                                                                                                      2530
                                                                                                                                                                                                                                                                                                                                                                          1140
                                                                                                                                                                                                                                                                                                                                                                                                2590
                                                                                                                                                                                                                                                                                                                                                                                                                    1080
                                                                                                                                                                                                                                                                                                                                                                                                                                           2650
                                                                                                                                                                                                                                                                                                                                                                                                                                                              1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   900
```

```
JOURNAL
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        U00015/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ORGANISM
                        CDS
                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (01-MAR 1994) Department of Genetics, Harvard Medical School, 200 Longwood Avenue, Boston MA 02115
On Mar 31, 1994 this sequence version replaced gi:414221.
This sequence data was produced by the Genome Sequencing Center located at Collaborative Research Incorporated (1365 Main St., Waltham MA, 02159). 617-487-7979). Please contact Doug Smith (smither.cric.com). The annotation should be considered
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (01-NOV-1993) Department of Genetics, School, 200 Longwood Avenue, Boston MA 02115 (bases 1 to 42325)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rinke de Wit, T.F., Clark-Curtiss, J.E., Abebe, F., Janson, A.A., van Agterveld, M. and Thole, J.E. A Mycobacterium leprae-specific gene encoding an recognized 45 kba protein
                                                                                                                                                                                                                                                                                                                                                                                                                   preliminary and incomplete.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacteria contain two GroEl genes. The second Mycobacterium leprae GroEL gene is arranged in an operon with GroES mol. Microbiol. 6, 1995–2007 (1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Robison, K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Smith,D.R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 antigen from M. leprae
Infect. Immun. 61, 2145-2153 (1993)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Janson, A.A.M. and Thole, E.R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Robison, K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    93239328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Vega-Lopez, F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hermans, P.W.M., van Soolingen, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rinke de Wit, T.F., Bekelie, S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        U00015.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (bases 1 to 42325)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (bases 38281 to 41190)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bases 3688 to 5472)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          bases 1 to 42325)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  bases 2759 to 5248)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Microbiol. 10 (4), 829-838 (1993)
                                                                                                                          /translation="MPVTIDPRRHSAALFDLDAVVTDTPLDSTVTLVRQLQGIGVGTA
VESTMENSQGYLTATGLDHLEFVHVDGLASGKVTLVAAANELMAQPGGCVVVAVDAA
GITAARYGGFALVLGLVTGEDDOTGHRDTLRNGSEDD
ALQTLGLTDDLTARQPAVFFDFDGTLSDIVDDPDSARPVPGATEALQKLATHCFVAIL
                                                                                SGRDLADVIKRIGVPGIWYSGSHGFESTAPDGTHHQNDAAEATIPILEQAATQLRDQL
GPIPGVMVEHKREGVAVHYRNVARDRVNEVAVAVRTAGQRNALRVTTGREVIELRPDI
/note="weak match 42.1 KD
                     complement(1979.
                                         HTEDGNRATAALFTLDSPMHVSEFTERLARQLSDTQR"
                                                               DWDKGKTLHWVIDRLHHAGTQVGSASLMPICLGDDITDEDAFDAVRHTDVGGIPIVVR
                                                                                                                                                                                                        /protein_id="AAC43238.1"
/db_xref="GI:466950"
                                                                                                                                                                                                                                                    /product="otsp"
                                                                                                                                                                                                                                                                                                               /note="Trehalose-6-phosphate phosphatase; B1620_F1_1"
                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                /codon_start=1
                                                                                                                                                                                                                                                                                                                                                        /organism="Mycobacterium leprae"
/db_xref="taxon:1769"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                42325 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          immunological characterization of a 42kDa serine-rich
                                                                                                                                                                                                                                                                                                                                         .1908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B1620.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Osland, A., Miko, T.L., D., Drijfhout, J.W., Sc
protein; B1620_C3_270"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  an immunologically
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Harvard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Kolk, A.H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Schoeningh, R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-MAR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Medical
                                         CDS
                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
```

```
/codon_start=1
/transl_table=11
/product="B1620_C2_214"
                                                                                                                                                             complement(9111.
                                                                                                                                                                                                                    PRTYSYSYLMDGRIDHYELSKRYTWMSESQVASEILYLADLARQKAQSAQYTFILDKL
SQLADGDEHRVALLRESYGNTWNLPSPEQAAEAEAEVFATRYSDYCPAQDTENDQW"
                                                                                                                                                                                                                                                                                                                                                      /product="B1620_C3_264"
/protein_id="AAC43234.1"
/protein_id="AAC43234.1"
/db_xref="GI:466946"
/translation="MGSRRRINRRLLPMSTEPAWQEFRRDVVVVVPPGNDFDRDDCDTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(8447. .9097)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6340.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DSMSQSYNTCGSVAQSELCDSPFGTPSQSSQSNDLSATSLTQQLGGLDS!ISSASASL
LTTNSISSSTASSIMPIVASQVTETLGRSQVAVEKMIQSISSTAVSVDVAASKVVAGV
GQAVSVGALRVPENMATASQPVMATAHSVPAGCSAITTAVSGPLEGVTQPAEEVLTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EVSDTIVVAVPASFAGETSDMLASRVSTFVAMLDGNAENAGLIARVLHAVAYAFEEAR
AGMVPLLTVLGNIIHTMALKAINWFGQVSTTVAALEADYDLMWVQNSTAMTTYRDTVL
RETGKMENFEPAPOLVSRYCMDRRDSVNSFHSSSSSDSLYESLDNLYDSVAQSEEHGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="ag45"
/protein_id="AAC43220.1"
/db_xref="GI:466932"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(3910. .5136)
/note="45 KDa serine-rich"/
/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation-"MDHRRSLSCRDKGEEQEPDRCVVWPRYGPGIWDAESLIRGPRWS
SRVWGSVGATAGGTGFSGS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MYCLRGLAGFLKPILYVLSRYGVPGRALVVELGKGLAPNISSIYLTGVSRRDADHLDLENRARADGVSY"
complement(2282...2473)
                                                                                                                                                                                                                                                                                                                                 DPWGVGGAAHWTIDPIVGFASSSAPQDRGTDVDNTRGQAEEDEKQKEPEVAIFTVTNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="mvnvhalittdvnaegyretlgcgcdhrrrrgrlvevsavadrp
LAFRRGYLGHQRCPRRTARHNQGQPPGVFWQRCRIYLGHQPHGLRTHGFLTVGAYPAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(7286. .7606)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LDGIVRDKRITRTTEHDKQAPPGHRVPDQPGLVNAKVPGSVVESPISRMFRRCMRCGY
TAFCVDVFSRRIPGWPGRTSKTTVLVTSLFEQALFIRKYYELRFFAMDFSAPLGCR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /protein_id="AAC43241.1"
/db_xref="GI:466953"
/translation="MFDLCVANRRVYGVRKLRNTAKRAGHDWRHDHDIGVARVMCLAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADQVSKLVSQVFSSYGKQYEGYAAQGVDQSRLFVQSLKDAAGDYMDSDHMYLNTED"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /protein_id="AAC43225.1"
/db_xref="GI:466937"
/translation="MSFFLRVEVGGLMMAAGRLERITSESMACNAKLTDVTTKVVPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(5262.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VAGGSGTGGPAFNEAV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /protein_id="AAC43235.1"
/db_xref="GI:466947"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="transposase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="transposase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="u1620k"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /protein_id="AAC43237.1"
/db_xref="GI:466949"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="u1620b"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="u1620a"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="weak match 32KD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              translation="MFDFMVYSPEVNAFLMSRGPGSTPLWGAAEAWISLAEQLMEAAQ/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /protein_id="AAC43236.1"
/db_xref="GI:466948"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="u1620n"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="weak match to (gp:x66077); B1620_C3_269"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="u1620m"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .5564)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B1620_C3_266"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B1620_F1_4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein (sp:p16645); B1620_C2_218"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    antigen; B1620_C1_177"
```

```
Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                               40327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                      121
  181
                                                                                                                                                                                                                                                                                                                                                                   Local Sinhes 1278;
                                                                                                                                                                                                         61
                                                                              agcaagctgatcgaatacgaacgaaaccgcgcgtcgcgccatggaggtcggcatggacaag
                                                                                                                                                                                 gaagatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaac
                                                                                                                                                                                                                                                               AGCAAGCTGATTGAGTACGACGAAACCGCGCGTCATGCCATGGAGGTGGGCATGAACAAG
                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
/transl_table=11
/transl_table=11
/product="81620_F2_68"
/protein_id="AAC43243.1"
/protein_id="AAC43243.1"
/protein_id="AAC43243.1"
/db_xref="GI:466955"
/translation="MYDIDGRIESINPAATRILGIRAHDVVDMKHGHPFCFYDTDNOR
/translation="MYDIDGRIESINPAATRILGIRAHDVVDMKHGHPFCFYDTDNOR
/translation="MYDIDGRIESINPAATRILGIRAHDVSRILAAVILLDIDDFKVI
/TANSLAHLSIERLTYEATHOCLTGLANRREAEDQITMSLQHDERSRLAAVILLDIDDFKVI
NDSLGHDVGDAVLQTVAQRIRSAVFDDVVARLGGDEFTVLLRGPLSDMNANDVAKRL
HTTLSSSLVVDQLTVPTGAASVGTLEVRPDDRTRAADILADDSAMYAAKNKKQCAVTP
QQLVPPVALIALFVPETTAAACAKFYAPSNLLVILQQTVVLAIVCFAYGKIPSFVSTLOML
SVGSIVALTGVTAALVAAQNQFAAIVTALLVGLAAGMVNGIVFAXGKIPSFVSTLOML
QVCRGITLMISDSSAKPMPFHGILGAMGAMPWILIVCLEVTILAGILFQFTMFGRWVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="rbsB"
/protein_id="AAC43242.1"
/protein_id="AAC43242.1"
/db_xref="G::466954"
/translation="MSTGTSVPLRVASIMLILGLLPAILPACGFSESHHKLTIGVSYP
TAMSPFWHAYTREIDEGSHQLGYVINAVSAEEDEQKOLSDVETLINQGIDGLIVTPQS
TSIAPTLLRIATQANIPVVVVDRYPGYAPGQNKNADYVAFLGPNNEKAGSGIAEALMA
GGSKFLALGGWEGNSVAQGRKAGLESALTAVGHLVQPQYAGDSEDKGLAAAENMLQ
AHPAGDANAIWCFNDKLCQGAIKAVYNANREKEFIFGGMDLTPQAIAAIENGLYTVSL
GAHWLEGGFGLAILYRKIHGQDDAERMVKLDLLKVDKSNVAKFKARYIDNTPHYNWKS
TTPPEDMTITLN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18218.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transi_table=11
/product="B1620_C2_213"
/protein_id="Ac64323.1"
/protein_id="Ac64323.1"
/db_xref="GI:466935"
/translation="MSGAFIIDPTLKAIEAWHALLGIGVPNDGGVLYSSISFFEKALE
HLAAAFPGDGWLGSAADKYAGQNRKRVDIFQELAELDKELIELIHNQANSVQTTRGIL
DGAKKALLFVRRVAIDLNYIPLYGSVNSASIQAQACAAAMAAVSGGLAYLLVQTAIHT
AKFVALLARLAHLLASAVADVVSDGVAIIKGIVDHLWHFIAGALTGLKDIVEKIIHWF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /translation="MRSMIDNLTVQSEHLNSLASQHENEAACASSGVSAAAGLANAVSTSHGSYCAQFNDTLKMYEDAHRTLGESLHTGGIDLARVLRVAAAMYCDADEICGSDIKSAFG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /trans1_table=11
/product="B1620_F1_14"
/protein_id="AAC43239.1"
/db_xref="GI:466951"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GMGGSQGMGGMTPASTKSKKDERKKKKYSEGAAAGTDDAERAPIEVQSGGGKRALAQH
VV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FGLFSHWWSRLHSFFGGIPGLSGATSGLSQVTGLFGVPGLAGSSGLLSGESLLSTENL PSLAGVGAGLGLGSLPQLAQLHAASTRQGTRSQAGVSAELSTEQFGGQQEPVSAQGSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(9489.
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16793.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AIKVGVPKTRCALTNSISLPTTVTQTTSAWPTREQLLRPIALS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13693.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="D-Ribose periplasmic binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /protein_id="AAC43224.1"
/db_xref="GI:466936"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          translation="MSKPLQPECADHIAAVVLFGMTNFQAMNFLGESPVAIGPAHQAK/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon
                                                                                                                                                                                                                                                                                                                                                                                           66.48;
79.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .17830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13956
                                                                                                                                                                                                                                                                                                                                                                Score 1074.2;
Pred. No. 1.6e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                              1.6e-
                                                                                                                                                                                                                                                                                                                                                                           DB .
-111;
`]°
                                                                                                                                                                                                                                                                                                                                                                     318;
                                                                                                                                                                                                                                                                                                                                                                                                                   73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein;
                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                      180
                                                                                                                                                                                                                                                                                                                  60
  240
                                                     40148
                                                                                                                                                         40208
                                                                                                                                                                                                                                                                                                                                                                <u>ب</u>
```

δ

ОУ ОУ ОУ ОУ

```
20
                                      а
                                                           δÃ
                                                                                      밁
                                                                                                              δõ
                                                                                                                                        밁
                                                                                                                                                               Qy
                                                                                                                                                                                         밁
                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                      QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                       39187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     39787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        39847
                                                                                                                                         39247
                                                                                                                                                                                                                                                                                               39427
                                                                                                                                                                                                                                                                                                                                               39487
                                                                                                                                                                                                                                                                                                                                                                                                39547
                                                                                                                                                                                                                                                                                                                                                                                                                                                 39607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             39967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                40147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   39667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            39907
              1261
                                                                                                                                                                                                                                                                                                                       901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
cgcaaggogctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgac
                                                                                                                                                                                                                                                                                                                                              gtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaagggggccgtacttcggtgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aaggccgcggtcgagggagggcatcgtccctggtgggggagcctcgctcatccaccaggcc 1260
                                                                                                   aaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcgggatcgggaa
                                                                                                                                                                                                                                                         gtggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggcc
                                                                                                                                                                                                                                                                                               GAAACCGGCCTGGTGCTGCGCGAGGTGGGCACTGACGTGCTGGGCTCGGCCCGCCGTGTG
                                                                                                                                                                                                                                                                                                        gacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggtaagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CAGGAGAAGATCAGCTCGCTGCCTGAGTTGCTGCCGATGCTCGAGAAGGTCACTGAGTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               caagacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GCCATCACGCAGGTTGCGACGGTTTCTTCGCGCGACGAGCAGATCGGTGCGCTGGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggcatcgcgcaggtggcgacggtgtcctcgcgcgcgacgagcagatcggtgacctggttggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GACGTCGCTGGCGACGGCACTACCACCGCGACCGTGTTGGCCCAGGCGCTGGTCAAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gatgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggc
                                                                                       GTCACCGAGACGCCTGAAGAAACGCAAGGAAAGCGTCGAAGACGCCGTCGCGGCTGCG
                                                                                                                                         AAGCTGCAGGAGCGCGTGGCCAAACTGGCCGGTGGCCGTCATCAAGGTGGGGGCCT
                                                                                                                                                                                          AAGCGAGTCAATCAGCTGCGGGCCGAGATAGAGGTCAGCGACTCAGAATGGGATCGCGAA
                                                                                                                                                                                                                                             GTGGTTAGTAAGGACGACACGATCATCGTCGACGGCGGCGGTTCCAACGACGCGGTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                GTTAACTCGATCCGCAAGACGCTCAAGGCGGTTGCGGGTTAAGTCCCCGTTCTTCGGCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                GGCAAGCCGCTGCTGATCGTCGCCGAAGACCTCGAGGGTGAAGCATTGGCGACGCTTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCCGCCGACGCGGTGTCCGAGGCACTGCTGGCCGGTAGCAACCCCGGTGGCCGGCAAGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggcctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgttgggaatcggcaag
                                      AAGGCGTCTATCGAGGAGGGTATCATCGCGGGTGGTGGATCGGCGCTCGTCC---AGTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGCCTGCGCATGGTCGCCGCCGGGGCCAACCCGGTCGCCCTAGGTGCTGGCATCAGCAAG
                                                                                                                                                                                                                                                                     1020
                                                                                                                  1200
                                                                                                                                                                   1140
                                                                                                                                                                                                                     1080
                                                                                                                                                                                                                                             39308
                                                                                                                                                                                                                                                                                              39368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  39608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                       960
                                                                                                                                                                                                                                                                                                                                                                         900
                                                                                                                                                                                                                                                                                                                                                                                                                         840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               40028
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                40088
               1320
                                         39071
                                                                                        39128
                                                                                                                                                                                            39248
                                                                                                                                                                                                                                                                                                                                                39428
                                                                                                                                                                                                                                                                                                                                                                                                39488
                                                                                                                                                                                                                                                                                                                                                                                                                                                  39548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    39668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     39728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        39788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            39848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             39908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              39968
```

밁

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 6
STMGROELX
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            38770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        38830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              39010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            39070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtcgacaagccggccaaggcagaagatcacgaccatcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      accctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTGGACAAGCCGGCCAAGACAGAAGAGCATGACCACCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggctcggtggtcgaccacgtcagcgagctacccgccgggcatgggctgaacgtgaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TCAGCGGTGCTTAACGCGGCCTCGGTGGCGCGGATGATGCTCACCACCGAAACGGCGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACGCTGGGCTATGGCCGATTTGGTCGCCGATGGTGTCGTCGACCCGGTCAAGGTCACCAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGCGCGGTGGTCGACAAGGTTAGCGGGCTGCCCGCCGGGCACGGACTGAATGCTAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTATTTTCGAGGCGCTCAAGGCACCGCTTTACTGGATTGCCACTAACGCCGGGTTGGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGCGCGCGCTCAAGCAATTGCGTACGTCGCTGACCGGAGACGAAGCCCTCGGCATCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         M76657
M76657.1 GI:153290
M76657.1 GROES protein; heat sh GROEL1 protein; GROES protein; heat sh Streptomyces albus (strain G) DNA.
Streptomyces albus
Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STMGROELX 2386 bp
Streptomyces albus GROES
(GROEL1) gene, complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                92041639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Characterization of the groEL-like genes J. Bacteriol. 173, 7382-7386 (1991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 (bases 1 to 2386)
Mazodier,P., Guglielmi,G., Davies,J. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Actinomycetales; Streptomycineae;
                  AEAMDKVGKDGVITVEESNTFGVDLDFTEGMAFDKGYLSPYMVTDQERMEAVLDDPYI
LIHQGKIGSIQDLLPLLEKVIQAGGSKPLLIIAEDVEGEALSTLVVNKIRGTFNAVAV
KAPGFGDRRKAMLGDMATLTGATVIAEEVGLKLDQAGLDVLGTARRVTVTKDDTTIVD
                                                                                                                                                                                                                                                                                                   567.
GGGNAEDVQGRVAQTKAEIESTDSDWDREKLQERLAKLAGGVCVIRVGAATEVELKER
                                                                         /translation="MAKILKFDEDARRALERGYNQLADTYKYTIGPKGRNVYIDKKFG
APTIINDGYTIAREVECDDPYENLGAQLVKEVATKTNDIAGDGTTTATVLAQALVREG
LRNVAAGASPAALKKGIDAAVAAVSAELLDTARPIDDKSDIAAVAALSAQDKQVGELI
                                                                                                                                     /transl_table=11
/product="GROEL1 protein"
/protein_id="AAA26753.1"
/db_xref="GI:153292"
                                                                                                                                                                                                                                                            /gene="GROEL1"
567. .2189
                                                                                                                                                                                                                                                                                                                                          GVVLAVGPGRFENGERLPLDVKTGDVVLYSKYGGTEVKYNGEEYLVLSARDVLAI I EK
                                                                                                                                                                                                                                                                                                                                                    /product="GROES protein"
/protein_id="AAA26752.1"
/db_xref="GI:295176"
/translation="MTTASSKVAIKPLEDRIVVQPLDAEQTTASGLVIPDTAKEKPQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /strain="G"
/db_xref="taxon:1888"
101 .409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="GROES"
101. .409
                                                                                                                                                                                                                   /gene="GROEL1"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="GROES"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GROES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (GROES)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          38732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Thompson, C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cds;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         05-MAY-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GROEL1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     albus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        39011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    38831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                38891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            38951
```

δõ В δÃ 밁 δÃ

В δÃ 맑 Ş

> ω KHRLEDAISATRAAVEEGIVSGGGSALVHAVKVLDDNLGRTGDEATGVAVVRRAAVEP LRWIAENAGLEGYVITTKVAELDKGQGFNAATGEYGDLVKAGVIDPVKVTRSALENAA SIASLLLTTETLVVEKPAEEEPEAGHGHGHSH" 863 c 802 g 309 €

COUNT

BASE CO Matches 1101; Query Match Best Local 1353 1293 1233 1113 1053 868 664 604 544 484 424 993 933 873 813 693 573 364 304 244 753 184 124 64 4 aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggccgacgc gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCGTACATG accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac GTGGTCAACAAGATCCGCGGCACGTTCAACGCCGTCGCCGTCAAGGCGCCCGGCTTCGGT 9tcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt GGCTCCAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCCGAGGCCCTGTCGACCCTG GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG GCGATGGACAAGGTCGGCAAGGACGGTGTCATCACCGTCGAGGAGTCCAACACCTTCGGT gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaagggaatcctccacgctgggc ATCGCCGCCGTCGCCGCGCTCTCCGCGCGCAGCAAGCAGGTCGGCGAGCTCATCGCCGAG GTCGCCGCCGTCTCCGCCGAGCTGCTCGACACCGCGCGCCGATCGACGACAAGTCCGAC gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc CTGCGCAACGTCGCCGCCGCCCTCCCCGGCCGCCCTGAAGAAGGGCATCGACGCCGCC ctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggcc ATCGCGGGTGACGGCACCACCGCGACCGTGCTGGCCCAGGCGCTGGTCCGCGAGGGC GACCCGTACGAGAACCTCGGCGCCCAGCTCGTCAAGGAGGTGGCGACCAAGACCAACGAC gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat TTCGGCGCCCCGACCATCACCAACGACGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa GCCGACACCGTCAAGGTGACCATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG AAGATTCTGAAGTTCGACGAGGACGCCCGTCGCGCCCTTGAGCGCGGGGGTGAACCAGCTG Similarity Conservative 45.9%; 67.8%; Score 741.8; I Pred. No. 4.3e. 0; Mismatches 0; 741.8; DB 7 No. 4.3e-74; DB 73; 507; Indels Length 15; Gaps 723 1172 483 1472 1232 1112 1052 243 957 897 1412 837 1352 777 1292 663 603 543 992 423 303 812 183 692 632 932 363 872 63 752 4.

δÕ 밁 δÃ 밁 QУ ₽ Qy 망 δÃ Вb Qy В QyВb 8 В δÃ B Ωy 밁 QY В Q В Qy В QΥ Ъ Q В οy

ω

```
REFERENCE
AUTHORS
TITLE
JOURNAL
                            BASE COUNT
ORIGIN
                                                                                                        VERSION
KEYWORDS
SOURCE
ORGANISM
                                                                                                                                       LOCUS
DEFINITION
ACCESSION
                                                                                                                                                              RESULT
AR028760
                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                       g
Qy
                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                      β
δ
                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                   ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                              γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                          FEATURES
Query
                                                                                                                                                                                               2187
                                                                                                                                                                                                                                                                                                                                        1378
                                                                                                                                                                                                                                                                                                                                                        1887
                                                                                                                                                                                                                                                                                                                                                                       1318
                                                                                                                                                                                                                                                                                                                                                                                       1830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1018
      Match
                                                                                                                                                                                                                                                                                                                        gacggctcggtggttggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtg
                                                                                                                                                                                                              tga
                                                                                                                                                                                                                                    gtggtcgacaagccggccaaggcaggagaagatcacgaccatcac---cacgggcacgcgcac
                                                                                                                                                                                                                                                                   aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc
                                                                                                                                                                                                                                                                                                 aacaccctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgact
                                                                                                                                                                                                                                                                                                                                                     gccaaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccag
                                                                                                                                                                                                                                                                                                                                                                                                                                                           gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgagggatgcggtcgcggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGCGTCTGCGTGATCCGCGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggttggt
                                                                                                                                                                                                                             GTCGTCGAGAAGCCGGCCGAGGAGGAGCCCGAGGCCGGTCACGGTCACGGGCACAGCCAC
                                                                                                                                                                                                                                                           CGCTCCGCCCTGGAGAACGCGGCCTCCATCGCCTCCCTGCTCCTGACGACCGAGACCCTG
                                                                                                                                                                                                                                                                                          GCCACCGGCGAGTACGGCGACCTGGTCAAGGCCGGCGTCATCGACCCGGTCAAGGTCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGGCCACCGAGGTCGAGCTGAAGGAGCGCCAAGCACCGTCTGGAGGACGCCATCTCCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTCACCGTCACCAAGGACGACACGACCATCGTGGACGGCGGCGGCAACGCCGAGGACGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACCCGCGCGCGGTCGAGGAGGGCATCGTCTCCGGTTGGTGGCTCCGCGCTGGTCCAC---
                                                                                                                               AR028760
Sequence
AR028760
AR028760.
                                                                 Unclassified.

1 (bases 1 to 1620)

Mazodier,P. and Guglielmi,G.

Mazodier, p. nucleotide sequence of the Regulatory nucleotide sequence of the Patent: US 5858773-A 10 12-JAN-1999;
                                                                                                        Unknown
                                                                                                                                                                                                             1617
                                                                                                                                                                                              2189
                                    287
                                    a
                                 /organism="unknown"
589 c 540 g
                                                   Location/Qualifiers
1. .1620
                                                                                                                                               10
                                                                                                                                              1620
from p
    45
    98
                                                                                                                                              patent
                                                                                                                                                       þ
    Score
                                                                                                                                               SD
                                                                                                                                               5858773.
    741
                                    204
    .
6;
    DB
                                                                          initiation
    81;
                                                                                                                                                       PAT
    Length
                                                                          0f
                                                                                                                                                       29-SEP-1999
                                                                          transcription
                                                                                                                                                                                                                                                                                                                                       1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1137
                                                                                                                                                                                                                                           1614
                                                                                                                                                                                                                                                                                                                                                                                                                    1829
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1652
                                                                                                                                                                                                                             2186
                                                                                                                                                                                                                                                           2126
                                                                                                                                                                                                                                                                                                                                                       1946
                                                                                                                                                                                                                                                                                                                                                                                      1886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1077
                                      Š
                                                      Ъ
                                                                    δÕ
                                                                                     망
                                                                                                     δ
                                                                                                                      DЬ
                                                                                                                                   οy
                                                                                                                                                   DЬ
                                                                                                                                                                   δÃ
                                                                                                                                                                                    DЬ
                                                                                                                                                                                                 γQ
                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                          δÕ
                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity 67.8 Matches 1086; Conservative
            1018
                            967
                                                          907
                                                                                         847
                                                                                                                       787
                                                                                                                                       778
                                                                                                                                                                                     667
                                                                                                                                                                                                    664
                                                                                                                                                                                                                     607
                                                                                                                                                                                                                                   604
                                                                                                                                                                                                                                                   547
                                                                                                                                                                                                                                                                 544
                                                                                                                                                                                                                                                                                  487
                                                                                                                                                                                                                                                                                                 484
                                                                                                                                                                                                                                                                                                                 427
                                                                                                                                                                                                                                                                                                                               424
                                                                                                                                                       727
                                                                                                                                                                      724
                                                                                                                                                                                                                                                                                                                                               367
                                                                                                                                                                                                                                                                                                                                                              364
                                                                                                                                                                                                                                                                                                                                                                              307
                                                                                                                                                                                                                                                                                                                                                                                            304
                                                                                                                                                                                                                                                                                                                                                                                                            247
                                                                                                                                                                                                                                                                                                                                                                                                                           244
                                                                                                                                                                                                                                                                                                                                                                                                                                           187
                                                                                                                                                                                                                                                                                                                                                                                                                                                          184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        64
   gccaaccgggcgaaccacttgcgtgccgagatcggcaatgagcgattcggattcgg
```

```
accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtggtggtcagcaaggacgacacggtcattgtcgacggcggcggcagcagcagaagcggtg
                                                                       cccgacgccggcattgtgctgcgcgaggtgggcttgggggtggggtcggccgacgc
                                                                                                                                    gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac
                                                                                                                                                                            gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccgacgcggtattcgaggcgtgctgctggctaggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAGGAGGTCGGCCTCAAGCTCGACCAGGCCGGTCTGGACGTGCTGGGCACCGCCGCCGC
                                                                                                                   GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                                                                            GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCCACCAG
                                                                                                                                                                                                                                                                                                                                                                                                                      GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCCGTACATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATCGCCGCCGTCGCCGCGCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GACCCGTACGAGAACCTCGGCGCCCAGCTCGTCAAGGAGGTGGCGACCAAGACCAACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gatcogtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
GTCACCGTCACCAAGGACGACACGACCATCGTGGACGGCGGCGGCAACGCCGAGGACGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATCGCGGGTGACGGCACCACCGCGGCGACCGTGCTGGCCCAGGCGCTGGTCCGCGAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     67.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. 5.50
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      i.5e-74;
nes 504;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                              846
                                                                                                                                                                                                                                                                                                                          723
                                                                                                                                                                                                                                                                                                                                                                                                                                          603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      126
                                                                                       957
                                                                                                                   906
                                                                                                                                                  897
                                                                                                                                                                                                                                      786
                                                                                                                                                                                                                                                                   777
                                                                                                                                                                                                                                                                                                 726
                                                                                                                                                                                                                                                                                                                                                            666
                                                                                                                                                                                                                                                                                                                                                                                                                    606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              66
```

243

1034

```
VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                         BASE COUNT
ORIGIN
                                                                                                                                                                                                                                        AUTHORS
TITLE
JOURNAL
FEATURES
                                                                                                                                                                                                                                                                                                                                                                   DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                          RESULT
AR028761
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ğ
   Ş
                           Db
                                               Qy
                                                                           B
                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                       EFERENCE
                                                                                                                            Query Match
Best Local Similarity
Matches 1092; Conserv
                                                                                                                                                                                                                                                                                                                 ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                          1561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1027
     124
                                                   64
                                                                                        4 aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                         9cc9acaccgtgc9g9tgac9ctg9g9ccgcgcggccggcatgtggtgctggccaaggcg
                                                                            AAGATTCTGAAGTTCGACGAGGACGCCCCGTCGCGCCCTTGAGCGCGGCGTGAACCAGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gtggtcgacaagccggccaaggcagaagatcacgaccatcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aacaccctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcccgcaaggcgctgaccgaactgcgttgcgtcgctgaccggtgacgaggtcctcggtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctggaa
                            GCCGACACCGTCAAGGTGACCATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTCGTCGAGAAGCCGGCCGAGGAGGAGGCCCGAGGCCGGTCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCGTCCGCCCTGGAGAACGCGGCCTCCATCGCCTCCCTGCTCCTGACGACCGAGACCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCACCGGCGAGTACGGCGACCTGGTCAAGGCCGGCGTCATCGACCCGGTCAAGGTCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCCGTCAAGGTCCTGGACGACAACCTCGGC----CGCACCGGCGACGAGGCCACCGGTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gccaaggccgcggtcgaggagggcatcgtccctggtggggggagcctcgctcatccaccag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GAGGGCTACGTCATCACCACCAAGGTGGCGGAGCTCGACAAGGGCCCAGGGCTTCAACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GCGGTCGTCCGCCGCCGCCGTCGAGCCGCTGCGCTGGATCGCCGAGAACGCCGGCCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCCGCGCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCGCTGGTCCAC---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAGAAGCTCCAGGAGCGCCTCGCCAAGCTGGCCGGCGCGTCTGCGTGATCCGCGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggtgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AR028761
Sequence
AR028761
                                                                                                                                                                                                                                                  Mazodler, P. and Guglielmi, G. Mazodler, P. and Guglielmi, G. Regulatory P. and Factoride Sequence of the initiation Patent: US 5858773-A 11 12-JAN-1999;
                                                                                                                                                                                                                                                                                                                            Unknown
                                                                                                                                                                                                                                                                                                    Unclassified
                                                                                                                                                                                                                                                                                                                 Unknown
                                                                                                                                                                                                                                                                                                                                                      AR028761.1
                                                                                                                                                                                                      446
                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                              11
                                                                                                                                                                                                  /organism="unknown"
946 c 927 g
                                                                                                                                                                                                                         Location/Qualifiers
1. .2668
                                                                                                                                                                                                                                                                                                                                                                             from
                                                                                                                                                                                                                                                                                                                                                                                           2668
                                                                                                                                        45.0%;
67.3%;
                                                                                                                                                                                                                                                                                                                                                                            patent
                                                                                                                                                                                                                                                                                                                                                                                           ģ
                                                                                                                           Score 727.4; DB 81;
Pred. No. 1.6e-72;
0; Mismatches 516;
                                                                                                                                                                                                                                                                                                                                                                              s_0
                                                                                                                                                                                                                                                                                                                                                                                           DNA
                                                                                                                                                                                                                                                                                                                                                                              5858773
                                                                                                                                                                                                      349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1599
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1602
                                                                                                                            Indels
                                                                                                                                                   Length
                                                                                                                                                                                                                                                                of
                                                                                                                                                     2668
                                                                                                                            15;
                                                                                                                                                                                                                                                               transcription
                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1320
   183
                           974
                                                                            914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1086
                                                                                                                            4.
              Š
                                      ₽
                                                          Q
                                                                                      Ъ
                                                                                                       Qy
                                                                                                                                     Dр
                                                                                                                                                        δÃ
                                                                                                                                                                                     DЬ
                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                           γ
                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
               1198
                                                                                                                1078
                                                                                                                                      1875
                                                                                                                                                               1018
                                                                                                                                                                                        1815
                                                                                                                                                                                                                                                                                       1695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1395
                                                                                                                                                                                                                                                                                                                                         1635
                                                                                                                                                                                                                                                                                                                                                                                          1575
                                                                                                                                                                                                                                                                                                                                                                                                                                          1515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   664
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      364
gccaaggccgcggtcgaggagggcatcgtccctggttgggggagcctcgctcatccaccag
                                                   gccaaccgggcgaaccacttgcgtgccgagatcgaccaggagcgattcggattgggatcgg
                                                                                                                                                                                                     gtggtggtcagcaaggacgaccaggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                    GACCGCCGCAAGGCGATGCTCGGCGACATGGCCACCCTCACCGGTGCCACCGTCATCGCC
                                                                                                                                                                                                                                                                                                   gaccgccgtaaggcgttccttgaggacctggcggtggtgacggggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                      gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTGACCGACCAGGAGCGTATGGAGGCCGTCCTCGACGACCCCGTACATCCTGATCCACCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        atcgcgcaggtggcgacggtgtcctcgcgcgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ctgaggctagtggccgccggcgtcaaccccggtcgcgctcggcgtgggaatcggccacgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTCGGCGCCCCGACCATCACCAACGACGGCGTCACCATCGCCCGTGAGGTCGAGTGCGAC
                                                                                                                                      GTCACCGTCACCAAGGACGACGACCATCGTGGACCTGGAGAAGGACGCCGAGGACGTC
                                                                                                                                                                                                                                        GGCAAGATCGGTTCGATCCAGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTCGCCGCCGTCTCCGCCGAGCTGCTCGACACCGCGCGCCCGATCGACGACAAGTCCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTGCGCAACGTCGCCGCCGCCCCCCGGCCCCCTGAAGAAGGGCATCGACGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTCGACCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCCCCCGTACATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCGATGGACAAGGTCGGCAAGGACGGTGTCATCAACGTCGAGGAGTCCAACACCTTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATCGCCGCCGTCGCCGCGCTCTCCGCGCAGGACAAGCAGGTCGGCGAGCTCATCGCCGAG
```

1334

483

543

1274

1214

423

1154

303

363

1257

1197

1994

2054

1874 1077

1934

1814

603 1454 663 1514 723 1574 777 777 1634 837

897

are

```
JOURNAL
MEDLINE
REFERENCE
                                                                                                                                                                                                                                          JOURNAL
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
SC6G4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FOCUS
                                                                                                                                                                                   TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DURCE
                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                    AUTHORS
                                                                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc 1557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aacaccctgagctatggtgacttggccgctgacggtcatcgacccggtcaaggtgact 1497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gacggctcggtggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtg 1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTCGTCGAGAAGCCGGCCGAGGAGGAGGCCGAGGCCGGTCACGGTCACGGGCACAGCCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtggtcgacaagccggccaaggcagaagatcacgaccatcac---cacgggcacgcgcac 1614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGCTCCGCCCTGGAGAACGCGGCCTCCATCGCCTCCCTGCTCCTGACGACCGAGACCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCACCGGCGAGTACGGCGACCTGGTCAAGGCCGGCGTCATCGACCCGGTCAAGGTCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAGGGCTACGTCATCACCAAGGTGGCGGAGCTCGACAAGGGCCAGGGCTTCAACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGGTCGTCCGCCGCCGCCGTCGAGCCGCTGCGCTGGATCGCCGAGAACGCCGGCCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCCGTCAAGGTCCTGGACGACAACCTCG----GCCGCACCGGCGACGAGGCCACCGGTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcccgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCCGCGCCGCGGTCGAGGAGGGCATCGTCTCCGGTGGTGGCTCCGCCGCTGGTCCAC---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AL031317
AL031317.1
10 kD chaper
                                              Direct Submission
Submitted (19-AUG-1998) Streptomyces coelicolor sequencing proje
Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge
CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof.
David A. Hopwood, [3] John Innes Centre, Norwich Research Park,
Colney, Norwich, Norfolk NR4 7UH, UK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALG31317.1 GI:3449234

10 kD chaperonin; 30S ribosomal protein S11; 30S ribosomal protein S13; 30S ribosomal protein S9; 50S ribosomal protein L13; 50S ribosomal protein L17; 50S ribosomal protein L13; 50S ribosomal protein L17; 50S ribosomal protein L36; 60 kD chaperonin; acetyltransferase; acpS; adenylate kinase; adk; alanine racemase; alr; coaA; cpn10; cpn60; dehydrogenase; DNA-directed RNA polymerase alpha chain; gcp; glmS1; glucosamine-fructose-6-phosphate aminotransferase; groEL1; groES; holo-[acy1-carrier protein] synthase; infA; lipase; map; methhonine aminopeptidase; synthase; infA; lipase; map; methhonine aminopeptidase;
                                                                                                                                                                                                              Parkhill, J., Barrell, B.G. and Rajandream, M.A.
                                                                                                                                                                                                                                                  Unpublished
                                                                                                                                                                                                                                                                                             Saunders, D. and Harris, D.
                                                                                                                                                                                                                                                                                                                                                                       A set of ordered cosmids and a detailed genetic and physical map for the 8 mb Streptomyces coelicolor A3(2) chromosome mol. Microbiol. 21 (1), 77-96 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Redenbach, M., Kieser, H.M., Denapaite, D., Eichner, A., Cullum, J., Kinashi, H. and Hopwood, D.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptomyces coelicolor A3(2).
Streptomyces coelicolor A3(2).
Streptomyces coelicolor A3(2)
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Streptomycineae; Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             O-sialoglycoprotein endopeptidase; pantothenate kinase; phospho-sugar mutase; pseudouridylate synthase; rplM; rplQ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Streptomyces coelicolor
Streptomyces coelicolor sequencing at The Sanger Centre is funded
                                   Notes:
                                                                                                                                                                                                                                                                                                                                                    9700035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            two-component regulator.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  rpoA; rpsI; rpsK; rpsM; translational initiation factor IF1; truA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 41055)
                                                                                                                                                                                                                                            bases
                                                                                                                                                                                                                                                                                                                      bases 1 to 41055)
                                                                                                                                                                                                                                          1 to 41055)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6G4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         28-MAR-2000
                                                                                                                                                        project,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                           CDS
                                                                                                                                                             RBS
                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon. Gene prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at http://www.nih.go.jp/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            overlapping sections once, or longer, because we arrange small overlap between neighbouring submissions.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               are also included but some of these may be fortuitous. The length in codons is given for each CDS.

Usually the highest scoring match found by fasta o is given for CDS which show significant similarity to other CDS in the database.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (URL; http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are numbered using the following system eg SC7B7.01c. SC (S. coelicolor), 7B7 (cosmid name), .01 (first CDS), c (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   restriction fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Cosmid 6G4 lies between D31 and D63 in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sequenced clone.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        upstream initiation codon.
IMPORTANT: This sequence MAY NOT be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    strand).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Details of S. coelicolor sequence available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       more significant matches with motifs in the PROSITE database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Phote-"SC6G4.01, adk, adenylate kinase, partial CDS, len: > 94 as; almost identical to KAD_STRCO adenylate kinase (EC 2 .7.4.3) (205 aa) and highly similar to many e.g. KAD_BORPE adenylate kinase (EC 2.7.4.3)(218 aa), fasta scores; opt: 2 53 z-score: 429.1 E(): 1.2e-16, 50.6% identity in 85 aa ove rlap. Contains Pfam match to entry PF00406 adenylatekinase, Adenylate kinases, score 136.80,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PF00406 adenylatekinase, E-value 3.2e-37"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene≃"adk"
<1. .286
                           /gene="map"
438. .1274
                                                                              438. .1274
                                                                                                                               423. .426
/note="possible
                                                                                                                                                                                                              Adenyla
                                                                                                                                                                                                                                                                                                                /translation="IAGRRVCRNEPKHVFHVTYTPPKKEGVCDVCGGELYQKDDDSEE
TVRKRLEVYHTQTEPIIDYYKSQGLVATIAATGPVDEVTRRALEALKRDQ"
                                                                                                                                                                                                                                                                                                                                                                                          /product="adenylate kinase"
/protein_id="CAA20379.1"
/db_xref="GI:3449235"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lo cus DNA from
1. .286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="98.4% match to
lo cus DNA from 4547 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Streptomyces
/strain="A3(2)"
/db_xref="taxon:100226"
/clone="cosmid 6G4"
                                                                                                                                                                                                                                    /note="Pfam match to
                                                                                                                                                                                                                                                             /gene="adk"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /label=adk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="adk"
                                                                                                    'label=*
                                                                                                                                                                                      'label='
                                                                                                                                                                                                                                                                                                                                                                          /db_xref="SPTREMBL:086771"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .41055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            coelicolor sequencing at the Sanger Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on/Qualifiers
                                                                                                                                                                                                              te
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  It may be shorter because we only sequence
                                                                                                                               upstream
                                                                                                                                                                                                              entry PF00406 adenylatekinase score 136.80, E-value 3.2e-37"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              o SCSECYDNA X83011 S.coelicolor secY to 6154"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      coelicolor A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the entire insert of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AseI-D genomic
```

```
misc_feature
                                                                                                                                                                                                                                                                                                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1416. .1637
/gene="infA"
1416. .1637
/gene="infA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a a identical to TR:054208 (EMBL:X83011) methionine aminopep tidase (278 aa) and highly similar to many e.g.AMPM_BACSU m ethionine aminopeptidase (EC 3.4.11.18) (248 aa), fasta scores; opt: 546 z-score: 922.2 E(): 0, 44.5% identity in 256 aa overlap. Also similar to S. coelicolor map2 (E(): 3.2e-3 3, 46.8% identity in 267 aa overlap). Contains PS00680 Meth ionine aminopeptidase subfamily 1 signature and Pfam match to entry PF00557 pep_M24, metallopeptidase family M24, score 194.80, E-value 1.4e-54"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note-"SC664.03, infA, translational initiation factor IFI, len: 73 aa; identical to TR:054209 (EMBL:X83011) translat ional initiation factor IFI (fragment) (65 aa) and highly similar to many e.g. IFI_BACSU translation initiation factor IF-1 (71 aa), fasta scores; opt: 384 z-score: 792.5 E(): 0 .78.6% identity in 70 aa overlap. Contains Pfam match to e ntry PF00575 S1, S1 RNA binding motif, score 54.10, E-value 3.1e-12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="SPTREMBL:054208"
/translation="MVQIKNPEQIAKMREAGLVVAAIHAATREAAVPGATTKDLDQVA/translation="MVQIKNPEQIAKMREAGLVVAAIHAATREAAVPGATTKDLDQVARVLAEHDAKPNFLGYGGFPATTCTS\NEVVV\HGIPSDDVVLKDGVISIDCGAIIDG
                                                                                                                                                                                                                                                                                                             1422. .1634
/gene="infA"
                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SWISS-PROT:054209"
/translation="MAKKQGAIEIEGTVVESLPNAMFKVELQNGHQVLAHISGKMRMH
YIRILPDDRVVVELSPYDLTRGRIVYRYK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1405. .1408
/note="possible
/label=*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        954. .1010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="methionine aminopeptidase"
/protein_id="CAA20380.1"
/db_xref="GI:3449236"
                                                                                                                                                                                                                                                           /note="Pfam match to
motif , score 54.10,
                                                                                                                                                                                                                                                                                                                                                                                                                                                    /protein_id="CAA20381.1"
/db_xref="GI:3449237"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="translational initiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
/transl_table=11
/label=infA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        signat ure"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      metallopeptidas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     {	t PRTEVLPDEWTVITTDGTWSSHWEHSVALTEQGPLVLTSPDGGKAKLAELGITAAPDP}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WHGDAAYTAFVGSGHSPELVELSRVTEESMWAGIAAMKOGNRLVDVSRAIETYIRRQP
KPGGGKYGIIEDYGGHGIGTEMHMDPHLLNYVDRRRGKGPKLVPGFCLAIEPMVSLGT
                                              /note="Pfam match to entry PF00444 L36, L 36, score 70.40, E-value 3.1e-22"
                                                                                                   1706. .1816
/gene="rpmJ"
                                                                                                                                                                                /note="possible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="PS00680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="map"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Pfam match
metallopeptidas e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /label=map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="SC6G4.02, map, methionine aminopeptidase, len:
.1819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Methionine
                                                                                                                                                                                   RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      to entry PF00557 pep_M24, family M24, score 194.80,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           upstream
                                                                                                                                                                                upstream of
                                                                                                                                                                                                                                                              entry PF00575 S1,
E-value 3.1e-12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aminopeptidase subfamily
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         factor
                                                                                                                                                                                                                                                                                         s_1
                                                                          Ribosomal
                                                                                                                                                                                                                                                                                         RNA binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E-value
                                                                       protein
```

CDS

gene

RBS

gene

RBS

```
Ş
                                                                                                                                                        밁
                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 1075;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                         34510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       34330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   34270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          34210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           34150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  34090 ATCGCGGGTGACGGCACCACCGCCACCGTGCTCGCCCAGGCGCTCGTGCGCGAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        34030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      33910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33850 AAGATCCTGAAGTTCGACGAGGACGCCCGTCGCGCCCTCGAGCGCGCGTCAACAAGCTC 33909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     33970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  124 tttggcggacccacggttaccaacgacggcgtcacggtggcacgttgagatcgagctggaa 183
                                                                                                                                                                                                                                                                                                                                                                                                            664 gacaagatcagcttccccgatctgttgccattgctggaaaaggt-----tgcagga 717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    544 accgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           364
778 gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt 837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           484 gcgatgaacaaggtcggccacgacagcgtggtcagcgtcaagggaatcctccacgctgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     244 gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 184 gatccgtttgaagacttgggcgcccagctggtgaagtcggtggcgcaccaagaccaacgat 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   64 gccgacaccgtgcgggtgacgctggggccggccggcatgtggtgctggccaaggcg 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4 aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                                                                                                                                                      acgggtaagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctg 777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa 663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CTGGAGCTGGACTTCACCGAGGGCATGGCCTTCGACAAGGGCTACCTGTCGCCGTACTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            atcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 THE THE TENTH OF T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCTCCAAGCCGCTGCTGATCATCGCCGAGGACCTGGAGGGCGAGGCGCTCTCCACCCTC
                                                                                                                                                                                                                                                                                                                                                    GGCAAGATCTCCTCCATCGCGGACCTGCTGCCGCTGCTGGAGAAGGTCATCCAGGCCAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTGACGGACCAGGAGCGCATGGAGGCCGTCCTCGACGACCCGTACATCCTGATCAACCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATCGCCGCCGTGGCCGCTGTCCGCCCAGGACCAGCAGGTCGGCGAGCTGATCGCCGAA 34329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GACCCGTACGAGAACCTCGGCGCCCCAGCTGGTGAAGGAGGTGGCGACCAAGACCAACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTCGGCGCCCCCACCATCACCAACGACGGCGTCACCATCGCCCGGGAGGTCGAGGTCGAG 34029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCCGACACCGTGAAGGTGACGATCGGCCCCAAGGGCCGCAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCGATGGACAAGGTCGGCAAGGACGGTGTCATCACCGTCGAGGAGGTCCAACACCTTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="rpmJ"
1706. 1819
/gene="rpmJ"
/gene="rpmJ"
/gene="scond"
/gene="rpmJ"
/gene="r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="50s ribosomal protein L36'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
/label=rpmJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           44.8%;
66.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0; Mismatches 531; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 724.4; DB 73; Pred. No. 9.3e-73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  34389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   34089
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             63
                                                                                                                                                        34629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                34509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 34449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          34269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 33969
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       34149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2;
```

Š рь

34630

Ş

34930

1138

В Š В δ 밁 Ωy Ъ

34810

958

898

```
GTCGTCGAGAAGAAGAAGAAGAAGAGCCGGCCGGCCGGTGGCCACAGCCACGGCCACT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9t9gtcgacaagccggccaaggcagaagatcacgaccatcaccacgggcacgcgcact 1615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aggtcggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtc 1557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aacaccctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgact 1497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccaaggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggtgggt 1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAGGGTTACGTCATCACCTCCAAGGTCGCCGACCTCGACAAGGGCCCAGGGCTTCAACGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggattgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGCTCCGCCCTGGAGAACGCCGCCTCCATCGCCTCCTCCTGCTGACGACCGAGACCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCCACCGGCGAGTACGGCGACCTGGTCAAGGCCGGCGTCATCGACCCGGTGAAGGTCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCGGTCGTCCGCCGCGCCGCGGTCGAGCCGCCTGCGATCGCCGAGAACGCCGGCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTCAAGGTGCTCGAGGGCAACCTCGG-----CAAGACCGGCGACGAGGCCACCGGTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcccgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAGAAGCTCCAGGAGCGCCTCGCGAAGCTGGCCGGCGGCGTGTGCGTGATCAAGGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CAGGGCCGCATCGCCCAGATCAAGGCCGAGATCGAGAACACGGACTCCGACTGGGACCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATCACCGTCACCAAGGACGACCACCACGATCGTCGACGGTGCCGGCAAGCGCGACGAGGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtggtggtcagcaaggacgacaggtcattgtcgacggcggcggcaccgcagaagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GACCGCCGCAAGGCGATGCTGCAGGACATGGCCGTCCTCACCGGCGCCACGGTCATCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gaccgccgtaaggcgttccttgaggacctggcggtggtgaccggggtggccacgtggtcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTCGTCAACAAGATCCGCGGCACCTTCAACGCGGTGGCCGTCAAGGCCCCCGGCTTCGGC
                                                                                                                                                                                                                                                                                                                                                       MSGBCG 2431 1
M.bovis BCG gene er
M17705
M17705.1 GI:14993
                                                                                                                                                                                                                                       M.bovis (strain BCG P3) DNA, clones pRIB110[2,3]
Mycobacterium bovis
Mycobacterium in Artinobacteria; Actinobact
Thole, J.E.R., Keulen, W.J., Kolk, A.H.J., Gr
Berwald, L.G., Tiesjema, R.H. and van Embden
Characterization, sequence determination,
64-kilodalton protein of Mycobacterium bov
Escherichia coli K-12
                                                                                                                                                 Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium; Cobacterium; Mycobacterium; Myc
                                                                                                                                                                                                                                                                                                                                                                GI:149933
                                                                                                                                                                                                                                                                                                                                                                                                                        encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                    þp
                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA
                                                                                                                                                                                                                                                                                                                                                                                                                        antigen
                                                                                                                                                                                                                                                                                                                                                                                                                        Þ
                                                                                   Embden, J
                                                                                                                                                                                                                                                                                                                                                                                                                        (MbaA),
                              bovis
                                                                                                                     Groothuis, D.G
                                                          and immunogenicity
                                                                                                                                                                                                                                                                                                                                                                                                                        complete
                                  BCG
                                                                                      D
                              expressed
                                                                                                                                                                                                                                                                                                                                                                                                                                                    26-APR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     35223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   35283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       35163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             35109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       34869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             35343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            34809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34689
                                                             o
H
   뮸
                                           δÃ
                                                                                                                  B
                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                          рь
                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                , Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BASE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local S
Matches 1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
MEDLINE
   1181
                                                                                                                     1121
                                                                                                                                                                                                                                           1061
                                                                                                                                                                                                                                                                                                                                                             1001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                          603
                                                                                                                                                                             543
                                                                                                                                                                                                                                                                                                  483
                                                                                                                                                                                                                                                                                                                                                                                                                        423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       581
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ω
   CGTGACCGACCCGGAGCGTCAGGAGGCGGTCCTGGAGGACCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                      agcgatgaacaaggtcggccacgacagcgtggtcagggtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGCCGATGCGGTAAAGGTGACATTGGGCCCCCAAGGGCCGCAACGTCGTCCTGGAAAAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CAAGACAATTGCGTACGACGAAGAGGCCCCGTCGCGCCCTCGAGCGGGGCTTGAACGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       atch 43.9%;
cal Similarity 66.0%;
1048; Conservative
                              cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                             GATTGCGGCCACCGCAGCGATTTCGGCGGGTGACCAGTCCATCGGTGACCTGATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                      catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggttgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgccgacgcggtattcgaggcgctgctggcatcggccacgccggttgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGTCGCCGGTGACGGCACGACGGCCACCGTGCTGGCCCAGGCGTTGGTTCGCGAGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTGGGGTGCCCCCACGATCACCAACGATGGTGTGTCCATCGCCAAGGAGATCGAGCTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9tttggcggacccacggttaccaacgacggcgtcacggttggcacgttgagatcgagctgga
                                                                                                                        GCTGCAGCTCGAGCTCACCGAGGGTATGCGGTTCGACAAGGGCTACATCTCGGGGGTACTT
                                                                                                                                              caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                           GGCGATGGACAAGGTGGGCAACGAGGGCGTCATCACCGTCGAGGAGTCCAACACCTTTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGTGGAGAAGGTCACCGAGACCCTGCTCAAGGGCGCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCTGCGCAACGTCGCGGCCGCCCAACCCGCTCGGTCTCAAACGCGGCATCGAAAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGATCCGTACGAGAAGATCGGCGCCGAGCTGGTCAAAGAGGTAGCCAAGAAGACCGATGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggccgacaccgtgcgggtgacgctggggccgcggcgggcatgtggtgctggccaaggc 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Infect. : 87193155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           đđ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     446 a 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Immun.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MAKTIAYDEEARRGLERGLINALADAVKVYLGPKGRNVVLEKKWG
APTITNOGVSIAKEIELEDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREG
LRNVAAGANPLGLKRGIEKAVLEKVTETLLKGAKEVETKEQIAATAAISAGDGSTGDLI
AEAMDKVGNEGVITVEESNTFGLQLELITEGMRFDKGYISGYFVTDPERQEAVLEDPYI
LLVSSKYSTVKDLLPLLEKVIGAGKPLLIIAEDVEGEALSTLVNKIRGTFKSVAVKA
PGFGDRRKAMLQDMAILTGGQVISEEVGLTLENADLSLLGKARKVVVTKDETTIVEGA
GDTDAIAGRVAQIRQEIENSDSOYDREKLQERLAKLAGGVAVIKAGANTEVELKERKH
RIEDAVRNAKAAVEEGIVAGGGVTLLQAAPTLDELKLEGDEATGANIVKVALEAPLKO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IAFNSGLEPGVVAEKVRNLPAGHGLNAQTGVYEDLLAAGVADPVKVTRSALQNAASIA
GLFLTTEAVVADKPEKEKASVPGGGDMGMDF"
1736 C 878 g 371 t
Lream of MluI site,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
/protein_id="AAA25358.1"
/db_xref="GI:149934"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'db_xref="taxon:1765"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 55,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1466-1475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 709.8; DB 2;
Pred. No. 1.5e-70;
0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bovis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
```

2431; 9;

Gaps

1;

62

640

SOURCE ORGANISM

KEYWORDS

REFERENCE

TITLE AUTHORS ACCESSION VERSION

DEFINITION

MSGBCG

1000

880

302

362

820

242

760 182

1060 482 밁 Ωy

35404

δõ В Qy В δÃ В Qγ В Š 밁 δÃ 망 Qy

35224

35164

35110

```
اي
   DEFINITION
ACCESSION
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                       RESULT 1
                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                           밁
                                                                                                                                                                                     δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                         Focus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1323
                                                                                                                                                           2132
                                                                                                                                                                                           1563
                                                                                                                                                                                                                                                                                                2012
                                                                                                                                                                                                                                                                                                                                                                  1952
                                                                                                                                                                                                                                                                                                                                                                                                  1383
                                                                                                                                                                                                                                                                                                                                                                                                                                    1892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 663
                                                                                                                                                                              cgacaagccggccaaggcagaagatcacg
                                                                                                                                                                                                                                                                                                                                                             CGACAAGCCGGAAAAGGAGAAGGCTTCCG
                                                                                                                                                                                                                                             caaggcgctgaccgaactgcgtcgctgaccgtgaccggtgaccgaggtcctcggtgtcgacgt 1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggattgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACGAGTGGCCCAGATCCGCCAGGAGATCGAGAACAGCGACTCCGACTACGACCGTGAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GGTCGGCCTGACGCTGGAGAACGCCCGACCTGTCGCTAGGCCAAGGCCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCGCAAGGCGATGCTGCAGGATATGGCCATTCTCACCGGTGGTCAGGTGATCAGCGAAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTCCAAGGTGTCCACTGTCAAGGATCTGCTGCCGCTGCTCGAGAAGGTCATCGGAGCCGG
                                                                                                                                                                                                                                                                                              CGGTGTCTACGAGGATCTGCTCGCTGCCGGCGTTGCTGACCCCGGTCAAGGTGACCCGTTC
                                                                                                                                                                                                                                                                                                                cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggtgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggccgcggtcgaggaggcatcgtccctggtggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CACCGAGGTCGAACTCAAGGAGCGCAAGCACCGCATCGAGGATGCGGTTCGCAATGCCAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GCTGCAGGAGCGGCTGGCCAAGCTGGCCGGTGGTGGTCGCGGTGATCAAGGCCGGTGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGTCACCAAGGACGAGCCACCATCGTCGAGGGCGCCGGTGACACCGACGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CAACAAGATCCGCGCCACCTTCAAGTCGGTGGCGGTCAAGGCTCCCGGCTTCGGCGACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCGCTGTCCACCCTGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                           GGCGCTGCAGAATGCGGCGTCCATCGCGGGGCTGTTCCTGACCACCGAGGCCGTCGTTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCCCCCCTCGAGGAGGGCATCGTCGCCCGGTGGGGGTGTGACGCTGTTGCAAGCGGCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
   MSGTCWPA 43;
M.tuberculosis;
M15467
M15467.1 GI:14;
antigen; cell wa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GACCCTGGACGAGCTGAAGCTCGAAGGCGACGAGGCGACCGGCGCCAACAT
     cell wall protein.
                       GI:149999
                                                     4380
is 65
                                                     bp
kDa
                                                     antigen
                                                                         DNA
                                                                                                                                                                                         1591
                                                       (cell wall
                                                     protein
                                                     a)
                                                                       14-FEB-1996
                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1082
                                                                                                                                                                                                                                                           1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1480
                                                                                                                                                                                                                           2131
                                                                                                                                                                                                                                                                                                                                                                2011
                                                                                                                                                                                                                                                                                                                                                                                                                                  1951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1022
                                                                                                                                                                                                                                                                                              2071
                                                                                                                                                                                                                                                                                                                               1502
                                                                                                                                                                                                                                                                                                                                                                                               1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOURNAL
MEDLINE
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Draft
by T.M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       J. Bacter
87137260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mycobacterium tuberculosis (strain Erdman) DNA.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacterida
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
Mycobacterium; Mycobacterium tuberculosis complex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Shinnick, T.M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                T.M.Shinnick, 04-MAY-1987.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      e 65-kilodalton
Bacteriol. 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="ceil wall protein A"
/product="ceil wall protein A"
/protein_id="AAAB8232.1"
/db_xref="Gi:150000"
/db_xref="Gi:150000"
/translation="MAKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWG
/translation="MAKTIAYDEEARRGLERGLYKEVAKKTDDVAGDGTTTATVLAQALVREG
APTITNDGVSIAKELEELPPYEKIGAELVKEVAKKVETKEQIAATAAISAGDQSIGDLI
AEANDKVKQNEGVITVEESNTGCLQLELTEGMRFDKGYISGYFVTDPPERQEAVLEDPYI
LLVSSKVSTVKDLLPLLEKVIGAGKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKA
PGFGGDRKAMLQDMAILTGGGVISEEVGLTLENADLSLLGKARKVVVTKDETTIVEGA
GDTDAIAGRVAQIRQEIENSDSDYDREKLQERLAKLAGGVAVIKAGAATEVELKERKH
RIEDAVRNAKAAVEEGIVAGGGVTLLQAAPTLDELKLEGDEATGANIVKVALEAPLKQ
IAFNSGLEPGVVAEKKRNLPAGHGLNAQTGVYEDLLAAGGVADPVKVTRSALQNAASIA
                                                                                                                                                /product="unknown protein"
/protein_id=AAA88234.1"
/protein_id=AAA88234.1"
/db_xref="GI:1196512"
/translation="MGAKYUDLKRLAAALPDYPFAYLITVDDGHRVHTVAVEPVLREL
PDGPDGPRAVVDVGLIGGRTRONLAHRSEVTLLWPPSDPSGYSLIVDGRAQASDAGPD
DDTARCGVVPTRALLHRDAAPDSPTAAKGCLHDCVVFSVP"
                                                                                                                                                                                                                                                                                    /transl_table=11
/product="unknown protein"
/protein_id="ana88233.1"
/protein_id="ana88233.1"
/db_xref="G::1195511"
/translation="MASRQVAHLLGHHARLQPGVEGDLLQRGLQRHLHDVGAGRLVAF
ELQLVQGRGRLQQRHTPTGDDALLDGGLGIANRILDAVLALLEFDLGGGTGLDHRDTT
GOLGQPLLQLLTVVVVVAVLDLLADLGHSSGDGVGVTGALDDGGLVLGDHDLAGLA"
complement(1940. .2368)
/note="ORF E142; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                           GLFLTTEAVVADKPEKEKASVPGGGDMGGMDF" complement(1194. .1670) note="ORF D158; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /translation="MTPSLPTLSIASAIRSPMDWSPAEIAAVAAICSLVSTSLAPLSRVSTFSTAFSMPRLRPSGLAPAATLRRPSRTNAWASTVAVVVPSPATSSVFLATSLTSSAPIFSYGSSSSISLAMDTPSLVIVGAPHFFSRTTLRPLGPNVTFTASARAFKPRSRPSAPIFSYGSSSSISLAMDTPSLVIVGAPHFFSRTTLRPLGPNVTFTASARAFKPRSRP
                                                                                                                   complement(2395. .3948)
/note="ORF; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RRASSSYAIVLAIAK"
252. .1874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(242. .769)
/note="ORF F175; putative"
/translation="MTPKMSGIEVPIPPRQRSLTVKLDRLTSPHFAWLPPEINSALMF
AGPGSGPLIAAATAWGELAEELLASIASLGSVTSELTSGAWLGPSAAAMMAVATQYLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="unknown protein"
/protein_id="AAA88231.1"
/db_xref="GI:1196510"
                                 /protein_id="AAA88235.1"
/db_xref="GI:1196513"
                                                                   /product="unknown
                                                                                     transl_table=11
                                                                                                                                                                                                                                                                         /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /strain="Erdman"
/db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 to 4380)
                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      antigen of Mycobacterium (3), 1080-1088 (1987)
                                                                   protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      [1] were kindly provided
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculosis
```

796

482 676 422 616

736

```
Query Match
Best Local Sin
Matches 1048;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sg
                                                              437
                                                                                                                                                                                                                     317
                                                                                                                                                                                                                                                                                                257
                          243
                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                      w
                                                                                agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                           gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                         ggccgacaccgtgcgggtgacgctggggccggccgggcatgtggtgctggccaaggc
                                                                                                                                                                                                                                                                                                                    caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                   CGCCGATGCGGTAAAGGTGACATTGGGCCCCCAAGGGCCGCAACGTCGTCCTGGAAAAGAA
                                                                                                                                                                                                                                                                                                CAAGACAATTGCGTACGAAGAGGGCCCGTCGCGGCCTCGAGCGGGGCTTGAACGCCCT
                                                            GGATCCGTACGAGAAGATCGGCGCCGAGCTGGTCAAAGAGGTAGCCAAGAAGACCGATGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _
                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       þp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WLSTAAAQAEQAAAQAMATATAFEAALAATVQPAVVAANRGLMQLLAATNWEGQNAPA
LMDVEAAYEQWMALDVAAMAGYHFDASSAAVAQLAPWQQVLRNLGIDIGKNGQINLGEG
NTGSGNIGHUNIGNNNIGNNNIGSGNTGTGNIGSGNTGSGNLGLGNLDGDGNIGFGNFG
SGNIGFGITGDHQMGFGGFUSGSGNIGFGNSGTSNGGFUNGGENSGSLNSGI
GTLGFGITGDHQMGFGGFUSGSGNIGFGNSGTGNVGLFNSGSSNIGTGNSGSLNSGI
GTLGSAGSLNTSFWNAGMQNAALGSAAGSEAALVSSAGYATGGMSTAALSS
GILASALGSTGGLQHGLANVLNSGLTNTPVAAPASAPYGGLDSGNPNPGSGSAAAGSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation="MNASRSNSWAAASVLAIPATLRGRWQTLSCIPAASRPLPGTR"
1 1372 c 1513 g 738 t
ream of TaqI site.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="unknown protein"
/product="unknown protein"
/protein_id="AAA88238.1"
/db_xref="GI:1196516"
/db_xref="GI:1196516"
/tanslation="MSAGARCPNQFVAASSCIRPRLAATTAGCTVAASAASNAVAVAM
/translation="MSAGARCPNQFVAASSCIRPRLAATTAGCTVAASAASNAVAVAM
ACAAACSACAAAVLSQARYWVATAIIAAADGPSQAPLVSSDVTEPSDAIDASNSSASS
PQAVAAAISGPDPGPANISAELISGGNHAKCGLVSRSNLTVSDRCRGGIGTSIPLIFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MITGDPPPDIPATGVAEADIPVAEVAEAQVAAAGVAAADVAGAG VAAADVVVADVVVADVAAAGVAEAQIDLAVLADVDAEVEQDLLEGRQLCDGRR RIEVVTSHRRHVQCPHLLVCRLDVHERRSVLPKPVRSCQQLHQATIGRYHCRLHGGRQ RRLERGRCCHGLCGRLFRLRCRRAEPG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3085.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="mrlrpshnwrpgsrscgtsastsartarsiwasatpaaatsatt
TSATTTSATTTSAAATPAPATSAAATPAAATWASATSATGISASATPVAGISGSGSPV
ITRWVSAASTRVAATSASGTRAPATSAYSTPAAETSASGIRAP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(2958.
/note="ORF E145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="ORF; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VIFGAPLGTASLPSPG" complement(3977.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="unknown protein"
/protein_id="AAA88237.1"
/db_xref="GI:1196515"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="unknown protein"
/protein_id="AAA88236.1"
/db_xref="GI:1196514"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ANPGLRSPGTSYPSFVNSGSNDSGLRNTAVREPSTPGSGIPKSNFYPSPDRESAYASF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /protein_id="AAA88239.1"
/db_xref="GI:1196517"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="ORF B176;
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="ORF A187;
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   transl/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                           43.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       _table=11
                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                        Score 709.8; DB 2;
Pred. No. 1.1e-70;
0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .3395)
putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          putative"
                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                 4380;
                                                                                                                                                                                                                                                                                                                                                                        9;
                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                         436
                                                                                                                                                                                                                                                                                                316
                                                                                                                                                                                                                   376
                                                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                                                                                                                                                        ۲,
    日
                                  Qy
                                                                          Вb
                                                                                                                Qy
                                                                                                                                                         В
                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                              QV
                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Бр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                              1517
                                                                                                                                                           1457
                                                                                                                                                                                                                                     1397
                                                                                                                                                                                                                                                                                                                1337
                                                                                                                                                                                                                                                                                                                                                                                             1277
    1568
                                                                                                                                                                                               1203
                                                                                                                                                                                                                                                                                                                                                      1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1097
                                                                                                                                                                                                                                                                                                                                                                                                                                 1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     797
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         617
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                363
                      gttctccgaagcccttgccgcgcgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                   CGTGAAGGTGGCGCTGGAGGCCCCGCTGAAGCAGATCGCCTTCAACTCCGGGGCTGGAGCC
                                                                                                    caaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgt
                                                                                                                                                                               ggccgcggtcgaggaggcatcgtccctggtgggggagcctcgctcatccaccagncccg
                                                                                                                                                                                                                                                                                                                GCTGCAGGAGCGGCTGGCCAAGCTGGCCGGTGGTGGTCGCGGTGATCAAGGCCGGTGCCGC
                                                                                                                                                                                                                                                                                                                                  ccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattcgggatcgggaaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGTCACCAAGGACGAGCCACCATCGTCGAGGGCGCCGGTGACACCGACGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGTCGGCCTGACGCTGGAGAACGCCGACCTGTCGCTAGGCAAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgccggcattgtgctgcgcgaggtggggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCGCAAGGCGATGCTGCAGGATATGGCCATTCTCACCGGTGGTCAGGTGATCAGCGAAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CAACAAGATCCGCGGCACCTTCAAGTCGGTGGCGGTCAAGGCTCCCGGCTTCGGCGACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CTCCAAGGTGTCCACTGTCAAGGATCTGCTGCCGCTGCTCGAGAAGGTCATCGGAGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    agcgatgaacaaggtcggccacgacagcgttggtcaagggtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   catcgcgcaggtggcgacggtgtcctcgcgcgagcgagcagatcggtgacctggtttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgttgggaatcggcaaggc
                                                                                                                                                           GGCCGCCGTCGAGGAGGGCATCGTCGCCGGTGGGGGTGTGACGCTGTTGCAAGCGGCCCC
                                                                                                                                                                                                                                                                                                                                                                                             ACGAGTGGCCCAGATCCGCCAGGAGATCGAGAACAGCGACTCCGACTACGACCGTGAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGTGACCGACCCGGAGCGTCAGGAGGCGGTCCTGGAGGACCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGCGATGGACAAGGTGGGCAACGAGGGCGTCATCACCGTCGAGGAGTCCAACACCTTTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GATTGCGGCCACCGCAGCGATTTCGGCGGGTGACCAGTCCATCGGTGACCTGATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGTGGAGAAGGTCACCGAGACCCTGCTCAAGGGCGCCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCTGCGCAACGTCGCGGCGCGCCCAACCCGCTCGGTCTCAAACGCGGCATCGAAAAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGTCGCCGGTGACGGCACCACGACGGCCACCGTGCTGGCCCAGGCGTTGGTTCGCGAGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCTGCAGCTCGAGCTCACCGAGGGTATGCGGTTCGACAAGGGCTACATCTCGGGGGTACTT
                                                                              -GACCCTGGACGAGCTGAAGCTCGAAGGCGACGAGGCGACCGGCGCCAACAT
```

Ş 밁 Q B Qy Вþ

δÃ

1456 1202

1567 1322 1516 1262 1142 1336 1082 1276

1216 962 1156 902 1096 842 1036 782 976 722 916

1396

Вþ

δ

밁 δõ 밁 γQ В δ Dр Ω

602 796

```
RESULT 12
08847
CUS
DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
AUTHORS
TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1383
                       423
                                                                                                                                   557
                                                                                                                                                                         303
                                                                                                                                                                                                                497
                                                                                                                                                                                                                                                                                         437
                                                                                                                                                                                                                                                                                                                                                                   377
                                                                                                                                                                                                                                                                                                                                                                                                                                              317
                                                                                                                                                                                                                                                   243
                                                                                                                                                                                                                                                                                                                              183
                                                                                                                                                                                                                                                                                                                                                                                                       123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cal Similarity
1048; Conserv
catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggttgacctggttggcga
                                                                                                                                                                                                                                                                                                          agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                                     9tttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                              99ccgacaccgtgcgggtgacgctgggggccgcgcgggcatgtggtgtgtggccaaggc
                                                                                cgccgacgcggtattcgaggcgctgctggcatcggccacgccggttgtccggcaagaccgg
                                                                                                                                                                                                              CGTCGCCGGTGACGGCACCACGACGGCCACCGTGCTGGCCCAGGCGTTGGTTCGCGAGGG
                                                                                                                                                                                                                                tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                         GGATCCGTACGAGAAGATCGGCGCCGAGCTGGTCAAAGAGGTAGCCAAGAAGACCGATGA
                                                                                                                                                                                                                                                                                                                                                                 GTGGGGTGCCCCCACGATCACCAACGATGGTGTGTCCATCGCCAAGGAGATCGAGCTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                          CGCCGATGCGGTAAAGGTGACATTGGGCCCCCAAGGGCCGCAACGTCGTCCTGGAAAAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGACAAGCCGGAAAAGGAGAAGGCTTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgacaagccggccaaggcagaagatcacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaaccgagacggtcgtggt 1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggttgactaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CGTGGAGAAGGTCACCGAGACCCTGCTCAAGGGCCCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGCGCTGCAGAATGCGGCGTCCATCGCGGGGCTGTTCCTGACCACCGAGGCCGTCGTTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GGGCGTGGTGGCCGAGAAGGTGCGCAACCTGCCGGCTGGCCACGGACTGAACGCTCAGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGGTGTCTACGAGGATCTGCTCGCTGCCGGCGTTGCTGACCCGGTCAAGGTGACCCGTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        108847
Sequence
108847
108847.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 (bases 1 to 4380)
2 (bases 2 to 51 to 4380)
2 (bases 2 to 51 to 4380)
2 (bases 2 to 51 to 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unclassified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unknown.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Unknown.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ū
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="unknown"
1375 c 1510 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               43.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 709.8; DB 81; Pred. No. 1.1e-70; 0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ĕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8805823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ٠
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 81;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ANTIGENS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEC-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                       482
                                                                                                                                                                                                                                                                                         496
                                                                                                                                                                                                                                                                                                                                                                 436
                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1687
                                                          676
                                                                                                                                   616
                                                                                                                                                                                                              556
                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                          242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1:
 밁
                                   Ş
                                                                        дЬ
                                                                                                        Qy
                                                                                                                                               В
                                                                                                                                                                                Qy
                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db
G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
 1748
                                                                                                                                                     1628
                                                                                                                                                                                                                                                                                                          1517
                                                                                                                                                                                                                                                                                                                                                                                   1457
                                                                                                                                                                                                                                                                                                                                                                                                                    1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                            1397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           797
                                                                                                                                                                                                                            99c99t9tt9aac9c9tcatc99tt9ccc99at99tactcaccaccgagac99tc9tg9t
                                                                      99tcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCGCTGTCCACCCTGGTCGT
GGCGCTGCAGAATGCGGCGTCCATCGCGGGGCTGTTCCTGACCACCGAGGCCGTCGTTGC
                                                                                                                                                                                                                                                                                                      CACCGAGGTCGAACTCAAGGAGCGCAAGCACCGCATCGAGGATGCGGTTCGCAATGCCAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaaggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACGAGTGGCCCAGATCCGCCAGGAGATCGAGAACAGCGACTCCGACTACGACCGTGAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGTCACCAAGGACGAGACCACCATCGTCGAGGGCGCCGGTGACACCGACGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGTCGGCCTGACGCTGGAGAACGCCGACCTGTCGCTAGGCAAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CTCCAAGGTGTCCACTGTCAAGGATCTGCTGCCGCTGCTCGAGAAGGTCATCGGAGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGTGACCGACCCGGAGCGTCAGGAGGCGGTCCTGGAGGACCCCTACATCCTGCTGGTCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GATTGCGGCCACCGCAGCGATTTCGGCGGGGTGACCAGTCCATCGGTGACCTGATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCTGCAGGAGCGGCTGGCCAAGCTGGCCGGTGGTGTCGCGGTGATCAAGGCCGGTGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCTGCAGCTCGAGCTCACCGAGGGTATGCGGTTCGACAAGGGCTACATCTCGGGGTACTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGCGATGGACAAGGTGGGCAACGAGGGCGTCATCACCGTCGAGGAGTCCAACACCTTTGG
```

Вр

Š

γQ

dg VQ 밁

δ

1807

1562

1502 1687 1442 1627 1382 1567 1322 1516 1262

1202

1456

1336

1082

1276 1022 1216 1156

902

962

1096

842

1036

976 722 916 662 856

1142

QΥ

В

Qγ В Ωy

B

δÃ

1563

1591

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 13
I08856
LOCUS
DEFINITION
ACCESSION
            QΥ
                                   밁
                                                  Qy
                                                                            DP
Pp
                                                                                                                      Оy
                                                                                                                                                                   밁
                                                                                                                                                                                       Ωy
                                                                                                                                                                                                              В
                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                             뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
ATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1808
                                                                                                                             677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            M Unknown.

Winclassified.
E 1 - (bases 1 to 4380)
E Shinnick, T. and Houghten, R.
SSHINNICK, T. AND FEPTIDES
WYCOBACTERIAL RECOMBINANTS AND PEPTIDES
HAL Patent: MO 8806591-A 105 07-SEP-1988;
ES Location/Qualifiers
1. 4380
/organism="unknown"
757 a 1372 c 1513 g 738 t
                                                                                                      483
                                                                                                                                                 423
                                                                                                                                                                       617
                                                                                                                                                                                                                                                                                                           437
               603
                                    797
                                                                                                                                                                                              363
                                                                                                                                                                                                                   557
                                                                                                                                                                                                                                                              497
                                                                                                                                                                                                                                                                                                                                183
                                                                                                                                                                                                                                                                                                                                                      377
                                                                                                                                                                                                                                                                                                                                                                         123
                                                                                                                                                                                                                                         303
                                                                                                                                                                                                                                                                                   243
                                                                                                                                                                                                                                                                                                                                                                                                   317
                                                                                                                                                                                                                                                                                                                                                                                                                                              257
                                                                                                                                                                                                                                                                                                                                                                                                                       63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         atch 43.9%; cal Similarity 66.0%; 1048; Conservative
                                                                             catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggttgacctggttggcga
                                                                                                                                                                                                                                                                                                         GGATCCGTACGAGAAGATCGGCGCCGAGCTGGTCAAAGAGGCTAGCCAAGAAGACCGATGA
                                                                                                                            GATTGCGGCCACCGCAGTTTCGGCGGGTGACCAGTCCATCGGTGACCTGATCGCCGA
                                                                                                                                                                       CGTGGAGAAGGTCACCGAGACCCTGCTCAAGGGCGCCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                  cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                tgttgccggtgacggcaccaccgccaccgcatcttggcgcaggcactgatcaagggcgg
                                                                                                                                                                                                                                                                                                                    agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccccccaagaccaacga
                                                                                                                                                                                                                                                                                                                                                                gtttggcggacccacggttaccaacgacggcgtcacggtggcacgttgagatcgagctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgacaagccggccaaggcagaagatcacg
cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                  CCTGCGCAACGTCGCGGCCGGCGCCAACCCGCTCGGTCTCAAACGCGGCATCGAAAAGGC
                                                                                                                                                                                                                                                              CGTCGCCGGTGACGGCACCACGACGGCCACCGTGCTGGCCCAGGCGTTGGTTCGCGAGGG
                                                                                                                                                                                                                                                                                                                                                     GTGGGGTGCCCCCACGATCACCAACGATGGTGTGTCCATCGCCAAGGAGATCGAGCTGGA
                                                                                                                                                                                                                                                                                                                                                                                                 CGCCGATGCGGTAAAGGTGACATTGGGCCCCCAAGGGCCGCAACGTCGTCCTGGAAAAGAA
                                                                                                                                                                                                                                                                                                                                                                                                            ggccgacaccgtgcgggtgacgctggggcggcgggccgggcatgtggtgtgtggccaaggc
                                                                                                                                                                                                                                                                                                                                                                                                                                             CAAGACAATTGCGTACGACGAAGAGGCCCCGTCGCGGCCTCGAGCGGGCCTTGAACGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                          caagctgatcgaatacgaacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          I08856
Sequence
I08856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4380
from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bp
Patent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 709.8; DB 81; Pred. No. 1.1e-70; 0; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8806591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                02-DEC-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                 482
            662
                                                                             796
                                                                                                                                                                       676
                                                                                                                                                                                                                  616
                                                                                                                                                                                                                                        362
                                                                                                                                                                                                                                                              556
                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                          496
                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                  376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
```

```
RESULT 14
MTV037
LOCUS
DEFINITION
ACCESSION
VERSION
                                                                                                   Qy
                                                                                                                        Вр
                                                                                                                                            Qy
                                                                                                                                                                 밁
                                                                                                                                                                                 δÃ
                                                                                                                                                                                                          밁
                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                        Db
                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                 дb
                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                         Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                           1748
                                                                                  1808
                                                                                                     1563
                                                                                                                                             1503
                                                                                                                                                                 1688
                                                                                                                                                                                     1443
                                                                                                                                                                                                                            1383
                                                                                                                                                                                                                                                 1568
                                                                                                                                                                                                                                                                                         1517
                                                                                                                                                                                                                                                                                                            1263,
                                                                                                                                                                                                                                                                                                                                 1457
                                                                                                                                                                                                                                                                                                                                                    1203
                                                                                                                                                                                                                                                                                                                                                                         1397
                                                                                                                                                                                                                                                                                                                                                                                           1143
                                                                                                                                                                                                                                                                                                                                                                                                                1337
                                                                                                                                                                                                                                                                                                                                                                                                                                    1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                857
                                                                                                                        gttctccgaagcccttgccgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                                                                                                                                                                                                                                                                                                               CGACAAGCCGGAAAAGGAGAAGGCTTCCG
                                                                                             cgacaagccggccaaggcagaagatcacg
                                                                                                                                                                                                                 ctcggtggtggtcaacaaggtcagcgagctacccgccgggcatgggctgaacgtgaacac
                                                                                                                                                                                                                                                                                                   CACCGAGGTCGAACTCAAGGAGCGCAAGCACCGCATCGAGGATGCGGTTCGCAATGCCAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGTGAAGGTGGCGCTGGAGGCCCCGCTGAAGCAGATCGCCTTCAACTCCGGGCTGGAGCC
                                                                                                                                                                                                                                                                                                                               GECCGCCGTCGAGGAGGGCATCGTCGCCGGTGGGGGTGTGACGCTGTTGCAAGCGGCCCC
                                                                                                                                                                                                                                                                                                                                           ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                  caccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcggtcgcggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGTCGGCCTGACGCTGGAGAACGCCGACCTGTCGCTAGGCAAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgcgtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agacaagatcagctcgcctcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                         GGGCGTGGTGGCCGAGAAGGTGCGCAACCTGCCGGCTGGCCACGGACTGAACGCTCAGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGTCACCAAGGACGAGACCACCATCGTCGAGGGGCGCCGGTGACACCGACGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCGCAAGGCGATGCTGCAGGATATGGCCATTCTCACCGGTGGTCAGGTGATCAGCGAAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCGCTGTCCACCCTGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt 782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGTGACCGACCCGGAGCGTCAGGAGGCGGTCCTGGAGGACCCCTACATCCTGGTCAG
                                                                                                                                                                                                                                                                                        -GACCCTGGACGAGCTGAAGCTCGAAGGCGACGAGGCGACCGGCGCCAACAT
                                                                                  1836
                                                                                                    1591
                                                                                                                         1807
                                                                                                                                              1562
                                                                                                                                                                 1747
                                                                                                                                                                                    1502
                                                                                                                                                                                                          1687
                                                                                                                                                                                                                                                                                        1567
                                                                                                                                                                                                                                                                                                                              1516
                                                                                                                                                                                                                                                                                                                                                    1262
                                                                                                                                                                                                                                                                                                                                                                       1456
                                                                                                                                                                                                                                                                                                                                                                                           1202
                                                                                                                                                                                                                                                                                                                                                                                                                1396
                                                                                                                                                                                                                                                                                                                                                                                                                                    1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                       1336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      976
```

MTV037 19781 bp E Mycobacterium tuberculosi AL021932 AL123456 AL021932.1 GI:3261527

DNA H37RV

complete

genome;

1998 22/162

gene

CDS

```
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacterium; Mycobacterium tuberculosis complex.

1 (bases 1 to 19781)
1 (bases 1 to 19781)
2 (cle,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C.,
Cole,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C.,
Harris,D., Gordon,S.V., Edylmeier,K., Gas,S., Barry III,C.E.,
Tekaia,F., Badcock,K., Basham,D., Brown,D., Chillingworth,T.,
Connor,R., Davies,R., Devlin,K., Feltwell,T., Gentles,S.,
Connor,R., Davies,R., Devlin,K., Feltwell,T., Gentles,S.,
Hamlin,N., Holroyd,S., Hornsby,T., Jagels,K., Krogh,A., McLean,J.,
Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A.,
Rajandream,M.A., Rogers,J., Rutter,S., Seeger,K., Skelton,S.,
Course, Consola B., Control B., Seeger, R., Skelton,S.,
Consola B., Caroca B., Caroca B., Caroca B., Seeger, S., Seeger, K., Skelton,S.,
Consola B., Caroca B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2909511.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Erratum:[[published erratum appears in Nature 1998 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complete genome sec
Nature 393 (6685),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S., Barrell. B. G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 available on the World Wide Web
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Notes:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Parkhill, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Deciphering the biology of Mycobacterium tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Barrell,B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Details of M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bases 1 to 19781)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have renumbered from the original cosmid submissions but the old designations are in brackets after the new gene numbers prediction was based on a Hidden Markov Model of TB genes
                                                                                                                                                                                      /note="Rv0438c, (MTV037.02c), len: 405. moeA-2, probable molybdenum cofactor biosynthesis protein (moeA-2) similar tomany e.g. ANY10817_2 (429 aa) and to Mycobacterium tuberculosis MoeA, MTCI337.08 (426 aa). FASTA scores: Y10817|ANY10817_2 A.nicotinovorans moaA, moeA, moeC (429 aa) apt: 786z-score: 843.2 E(): 0, 39.2% identity in 398 aa overlap;and Z94752|MTCI237_8 (426 aa) opt: 667 z-score: 716.7 E():2e-32; 36.5% identity in 425 aa overlap. TBparse scoreis0.889"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(42. .1259)
/gene="moaA3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="fragment designated v037. Does not represent a physical clone" % \left( 1\right) =\left( 1\right) \left( 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(42. .1259)
/gene="moaA3"
transl_table=11
                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          organism="Mycobacterium tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             In some cases we may not have predicted the correct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .>19781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tuberculosis sequencing at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence
5), 537-544 (1998)
```

gene

RBS

CDS

CDS gene

complement(4195. .4623) /gene="Rv0441c"

complement(4195.

/note="PS00296 Chaperonins cpn60 signature"

/gene="Rv0441c"

/gene="KVU441c, (MTV037.05c), len: 142. UIKHUWH JAWA/ /NOTE="RV0441c, (MTV037.05c), len: 142. UIKHUWH JAWA/ identical to hypothetical M. tuberculosis protein MSGTCWPA_4 (142aa). FASTAscores: M15467|MSGTCWPA_4 M.tuberculosis 65 kDa antigen (ce (142 aa) opt: 96 M

len: 142. Unknown but

misc_feature

```
/note="Rv0440, (MTV037.04), len: 539. groEL2, identical toM. tuberculosis GroEL-2. Has PS00296 Chaperonins cpn60 signature. PASTA scores: splP06806|CH62_MYCTU 60 KD CHAPERONIN2(PROTEIN CPN60 (539 aa) opt: 3318 z-score: 3673.1 E(): 0; 100.0% identity in 539 aa overlap. Teparse score is 0.847"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv0439c, (MTV037.03c), len: 311. Probable oxidoreductase similar to several e.g. spi003326j0XIR_STRAT (298 aa). FASTA scores: 440116jA40116_1 Sequence 6 from Patent W09423043. U (320 aa) opt: 518 z-score: 605.3 E(): 3.2e-26;35.5% identity in 304 aa overlap; and spi003326j0XIR_STRATPROBABLE OXIDOREDUCTASE (EC 1... (298 aa) opt: 400 z-score: 469. E(): 1.2e_18; 34.6% identity in 298 aa overlap. TBpars
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="
2507...
                                                                                                                                                                                                                                                   LRNVAAGANPLGLKRGIEKAVEKYTETLLKGAKEVETKEQIAATAAISAGDQSIGDLI
AEAMDKVGNEGVITVEESNTFGLQLELTEGMRFDKGYISGYFVTDPERQEAVLEDPYI
LLVSSKVSTVKDLLFLLEKVIGAGKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKA
                                                                                                                                                                                                                                                                                                                                                                                              /product-"groEL2"
/protein_id="CAA17397.1"
/db_xref="Gi:299515"
/translation="MAKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTELTRNLPRLIRPVATVLGPLLFQSPEMGALPTLRAATDPTTQGGQYYGPDGFGEQR
GHPKVVQSSAQSHDKDLQRRLWTVSEELTGVSFGV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAHVVLAVRNLEKGNAARARIMAARPGAHVTLQQLDLCSLDSVRAAADALRTAYPRID
VLINNAGVMWTPKQVTKDGFELQFGTNHLGHFALTGLVLDHMLPVPGSRVVTVSSQGH
RIHAAIHFDDLQWERRYNRVAAYGQAKLANLLFTYELQRRLGEAGKSTIAVAAHPGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              score is 0.903"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(1278. .2213)
/gene="Rv0439c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(1278. .2213)
/gene="Rv0439c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LAAALGLAELPVLPRQRVLVISTGSELASPGTPLQPGQIYESNSIMLAAAVRDAGAAV
VATATAGDDVAQFGAILDRYAVDADLIITSGGVSAGAYEVVKDAFGSADYRGGDHGVE
FVKVAMQPGMPQGVGRVAGTPIVTLPGNPVSALVSFEVFIRPPLRMAMGLPDPYRPHR
                                                                          GLFLTTEAVVADKPEKEKASVPGGGDMGGMDF*
                                                                                                     RIEDAVRNAKAAVEEGIVAGGGYTLLQAAPTLDELKLEGDEATGANIVKVALEAPLKQ
IAFNSGLEPGVVAEKVRNLPAGHGLNAQTGVYEDLLAAGVADPVKVTRSALQNAASIA
                                                                                                                                                                            PGFGDRRKAMLQDMAILTGGQVISEEVGLTLENADLSLLGKARKVVVTKDETTIVEGA
GDTDAIAGRVAQIRQEIENSDSDYDREKLQERLAKLAGGVAVIKAGAATEVELKERKH
                                                                                                                                                                                                                                                                                                                                                                <u>APTITNDGVSIAKEIELEDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREG</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="hypothetical protein Rv0439c"
/protein_id="CAA17396.1"
/db_xref="GI:2909514"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VAAGTQLQVWDLT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SAVLTASLTSPRGKRQFRRAILDHQAGTVISYGPPASHHLRWLASANGLLDIPEDVVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VFDNSAMDGYAVRAEDTSGATPQNPVMLPVAEDIPAGRADMLTLQPVTAHRIMTGAPV
PTGATAIVEYEATDGGVDSVAIRQQATPGKHIRRSGEDVAAGTTVLHNGQIVTPAVLG
3713. .3748
/gene="groEL2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="groEL2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SPTREMBL:053726"
/translation="MTANDNKTRKWSAADVPDQSGRVVVVTGANTGIGYHTAAVFADR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               translation="MRSVQEHQRVVAEMMRACRPITVPLTQAQGLVLGGDVVAPLSLP/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'db_xref="SPTREMBL:053725"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ="possible RBS, ggagga, for Rv0440"
.4129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    groEL2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         400 z-score: 469.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TBparse
```

```
Query Match
Best Local Similarity
Matches 1048; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                         2512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                      123
                                                                                                                                                                                                                        63
                                                                                                                                                                                                                                                                                           ω
                                                                     agatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacga
                                                                                                                                                                                                                                                                         caagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagct
                                                                                                                                      gtttggcggacccacggttaccaacgacggcgtcacggtggcacgtgagatcgagctgga
                                                                                                                                                                                     CGCCGATGCGGTAAAGGTGACATTGGGCCCCCAAGGGCCGCAACGTCGTCCTGGAAAAGAA 263:
                                                                                                                                                                                                       CAAGACAATTGCGTACGACGAAGAGGCCCGTCGCGGCCTCGAGCGGGCCTTGAACGCCCT
tgttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcgg
                                                  GGATCCGTACGAGAAGATCGGCGCCGAGCTGGTCAAAGAGGTAGCCAAGAAGACCGATGA
                                                                                                                     GTGGGGTGCCCCCACGATCACCAACGATGGTGTGTCCATCGCCAAGGAGATCGAGCTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="PPE"
complement(4650.
/gene="PPE"
/note="Rv0442c, ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /Translation="misser heamlpeinsalmfagpgsgpliaaatawgelaekilas
/Taslgytseltsganigpsaaamayatqylawlstaaaqarbaaaqamatayfafaa
Alaatqpayvaanrglwqllaatnwfgqnaplamdvraaxegwwaldyaamagyhfd
asaavaqlapwqqvlrnigidignufggqntgggntgggnignniggnnigggntgfgn
Missertgggniggnigfgnigggnigfgtgtgtghdhyggggnigfgn
Missertggsgniglnigggslnigggstinagigsslntsfwaggnigfgn
Setgnvglfnsgsgnigfgnigslniggtgnigfgnapligsgnigfgnaal
Gsaagseaalvssagyatggmstaasalssgilasalgstgsgndsglrntav
Aapasspyggldsgnppgsgsgaaagsganpelrspgtypffvnsgsndsglrntav
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv0443"
6295. .6810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPSTPGSGIPKSNFYPSPDRESAYASPRIGQPVGSE" 6295. .6810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis (strain Erdman) and to protein fragment from Mycobacterium bovis, ANS 346909_1 (302 aa). FASTA scores: sp{p42611|YHS6_MYCTU HYPOTHETICAL 50.6 KD PROTEIN IN H (517aa) opt: 3144 z-score: 2444.9 E(): 0; 98.4% identity in492 aa overlap; and S46909|S46909_1 (302 aa) opt:1897 z-score: 1484.3 E(): 0; 98.0% identity in302 aa overlap. TBparse score is 0.903"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MGAKKUDLKRLAAALPDYPFAYLITVDDGHRVHTVAVEPVLREL
PDGPDGPRAVVDGLIGGRTRONLAHRSEVTLLWPPSDPSGYSLIVDGRAQASDAGPD
DDTARGGVVPIRALLHRDAAPDSPTAAKGCLHDCVVFSVP"
complement(4650..6113)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="PPE"
/protein_id="CAA17399.1"
/db_xref="GI:2909517"
/db_xref="SPTREMBL:053727"
                                                                                                                                                                                                                                                                                                                                                                                         /product="hypothetical protein
/protein_id="CAA17400.1"
/db_xref="G1:2909518"
/db_xref="SPTREMBL:053728"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv0442c, (MTV037.06c), len: 487. Unknown member of PPE family, nearly identical to hypothetical protein from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
/product="hypothetical protein Rv0441c"
/protein_id="CAA17398.1"
/db_xref="GI:2909516"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note-"Rv0443, (MTV037.07), len: 171. Un
Alternativestart possible. TBparse score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          overlap. TBparse score
                                                                                                                                                                                                                                                                                                                                                                                                                                                        transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="Rv0443"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="SPTREMBL:Q50813"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         codon_start=1
                                                                                                                                                                                                                                                                                                                                        43.9%;
                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                        Score 709.8; DB 2;
Pred. No. 5.5e-71;
D; Mismatches 532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .6113)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            len: 171. Unknown
                                                                                                                                                                                                                                                                                                                                                        Length 19781;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             is 0.915
                                                                                                                                                                                                                                                                                                                        9;
                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                    182
                                                                                  242
                                                                                                                                                                                                                                                         2571
                                                                                                                   2691
                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                          1;
                                                                                                 Q
                                                                                                                                    멍
                                                                                                                                                               δÃ
                                                                                                                                                                                                     B
                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                       Db
                                                                                                                                                                                                                                                                                                Ŷ.
                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2872
                                                                    3772
                                                                                                   1263
                                                                                                                                    3712
                                                                                                                                                                    1203
                                                                                                                                                                                                       3652
                                                                                                                                                                                                                                                                         3592
                                                                                                                                                                                                                                                                                                         1083
                                                                                                                                                                                                                                                                                                                                          3532
                                                                                                                                                                                                                                                                                                                                                                           1023
                                                                                                                                                                                                                                                                                                                                                                                                           3472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2932
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2812
                                                                                                                                                                                                                                                                                                                                                                                                                                          963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                783
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      363
```

δÃ

94 64 64 64

5 B B B

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2752
CGTGAAGGTGGCGCTGGAGGCCCCGCTGAAGCAGATCGCCTTCAACTCCGGGCTGGAGCC
                                                                                                                                                                                                                                                                                                ggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggttggccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   agacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcaggaacggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    agcgatgaacaaggtcggccacgacagcgtggtcagcgtcaagggaatcctccacgctggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGTCGCCGGTGACGGCACCACGACGGCCACCGTGCTGGCCCAGGCGTTGGTTCGCGAGGG
                            gttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttggacgg
                                                                                                                          caaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtcgacgt
                                                                                                                                                                                                                      ggccgcggtcgaggagggcatcgtccctggtgggggagcctcgctcatccaccaggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                             ACGAGTGGCCCAGATCCGCCAGGAGATCGAGAACAGCGACTCCGACTACGACCGTGAGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cyccygcattytyctycycyayytygyytttygyayytyctyyyctcyycccyacycytyyt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCGCAAGGCGATGCTGCAGGATATGGCCCATTCTCACCGGTGGTCAGGTGATCAGCGAAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CAACAAGATCCGCGCCACCTTCAAGTCGGTGGCGGTCAAGGCTCCCGGCCTTCGGCGACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CTCCAAGGTGTCCACTGTCAAGGATCTGCTGCCGCTGCTCGAGAAGGTCATCGGAGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   caccgagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GATTGCGGCCACCGCAGCGATTTCGGCGGGGTGACCAGTCCATCGGTGACCTGATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     catcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCTGCGCAACGTCGCGGCCGCGCCAACCCGCTCGGTCTCAAACGCGGCATCGAAAAGGC
                                                                                                                                                                                                    GGCCGCCGTCGAGGAGGGCATCGTCGCCGGTGGGGGTGTGACGCTGTTGCAAGCGGCCCC
                                                                                                                                                                                                                                                                                                                                                                                                 GCTGCAGGAGCGGCTGGCCAAGCTGGCCGGTGGTCGCGGTGATCAAGGCCGGTGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGTCACCAAGGACGAGACCACCATCGTCGAGGGCGCCGGTGACACCGACGCCATCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGTCGGCCTGACGCTGGAGAACGCCGACCTGTCGCTAGGCAAGGCCCGCAAGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     taagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctggtcgt 782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GCTGCAGCTCGAGCTCACCGAGGGTATGCGGTTCGACAAGGGCTACATCTCGGGGTACTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGCGATGGACAAGGTGGGCAACGAGGGCGTCATCACCGTCGAGGAGTCCAACACCTTTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGTGGAGAAGGTCACCGAGACCCTGCTCAAGGGCGCCAAGGAGGTCGAGACCAAGGAGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cctgaggctagtggccgccggcgtcaacccggtcgcgctcggcgtgggaatcggcaaggc 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TAAGCCGCTGCTGATCATCGCCGAGGACGTCGAGGGCGAGGCGCTGTCCACCCTGGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CGTGACCGACCCGGAGCGTCAGGAGGCGGTCCTGGAGGACCCCTACATCCTGCTGGTCAG
                                                                                                 GACCCTGGACGAGCTGAAGCTCGAAGGCGACGAGGCGACCGGCGCCAACAT
                                                                                                   3822
                                                                                                                                                                                                    3771
                                                                                                                                                                                                                                                  1262
                                                                                                                                                                                                                                                                                                     3711
                                                                                                                                                                                                                                                                                                                                                   1202
                                                                                                                                                                                                                                                                                                                                                                                                    3651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2871
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           542
```

밁 QΥ ₽ Qy 밁 Qy 뫄 Qy

```
MEDLINE
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CUS
DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                       CDS
                                                                                                              mat_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1383
                                                                                                                                                                    -10_signal
                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4063
                                                                                                                                                                                                                       -35_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgacaagccggccaaggcagaagatcacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGACAAGCCGGAAAAGGAGAAGGCTTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggcggtgttgaacgcgtcatcggttgcccggatggtactcaccaccgagacggtcgtggt 1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cctgagctatggtgacttggccgctgacggcgtcatcgacccggtcaaggttgactaggtc 1502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGGCGTGGTGGCCGAGAAGGTGCGCAACCTGCCGGCTGGCCACGGACTGAACGCTCAGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCGCTGCAGAATGCGGCGTCCATCGCGGGGGCTGTTCCTGACCACCGAGGCCGTCGTTGC 4062
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGGTGTCTACGAGGATCTGCTCGCTGCCGGCGTTGCTGACCCGGTCAAGGTGACCCGTTC 4002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Streptomyces coelicolor Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S.coelicolor groES:
X75206
X75206.1 GI:406595
                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (24-SEP-1993) A.M. Duchene, Docteur Roux, 75724 Paris, Cedex 15, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Characterization of two groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 (bases 1 to 3000)
Duchene, A.M., Kieser, H.M., Hopwood, D.A., Thompson, C.J. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    groEL1 gene; GROEL1 protein; groES
Streptomyces coelicolor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Duchene, A.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94299177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mazodier, P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SCGROEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            144 (1), 97-101 (1994)
/gene="groES"
/codon_start=1
/transl_table=11
/product="GroES"
/protein_id="CAA53018.1"
                                                                                                                                                                    /gene=
590. .
                                                                                                                                                                                               /gene='
                                                                                                                                          /gene=*715...7
                                                                                                                                                                                                                                             /protein_id="CAA53017.1"
/db_xref="GI:406596"
/db_xref="SI:406596"
/db_xref="SWISS-PROT:E40179"
/translation="LONHTLDHRSLRGLPHAGQRAEICGQQTKLRSREGVRAHLERPP
HGTVDTTTLRAAADDGGITALVLWRATLDADGALTYTRGDHRLHPGDIVAVDPDHPTAA
                                                                                                               /gene='
                                                                                                                                                                                                                                                                                                                                                              /db_xref="taxon:1902"
<1. .390
                                                                      /product="GroES"
727. .1035
                                                                                                                                                                                                                                    NLAARTERLLETIEEQGLRVGNLENYL'
                                                                                                                                                                                                                                                                                                                      /trans
                                                                                                                                                                                                                                                                                                                                 /codon_start=J
                                                                                                                                                                                                                                                                                                                                              /note="ORF (3'end)"
                                                                                                                                                                                                                                                                                                                                                                                       /organism="Streptomyces
/strain="J1501"
                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 to 3000)
                                                                                               /gene="groES"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3000
                                                                                                                                                                                               e="groES"
.1035
                                                                                                                                            .719
                                                                                                                .1032
                                                                                                                            "groES"
                                                                                                                                                   "groES"
                                                                                                                                                                                                                                                                                                                    L_table=11
                                                                                                                                                                               groES"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        dq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         groEL1 genes for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene; GROES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in Streptomyces coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                            FRANCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BCT 28-JUL-1995
GroES and GroELl proteins.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                           25
                                                                                                                                                                                                                                                                                                                                                                                                                                                            rue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3942
Qy
                            В
                                                    Qy
                                                                                 В
                                                                                                      QΨ
                                                                                                                                       В
                                                                                                                                                              δÃ
                                                                                                                                                                                            В
                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                           ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
```

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity 66...
Matches 1072; Conservative
                                                                                                                                                                                                                                         1532
                                                                                                                                                                                                                                                                                                                                     1472
                                                                                                                                                                                                                                                                                                                                                                                                                                1412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mat_peptide
                                                                                                                                                                                          424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         184
544
                                                                                                                                                                                                                                                                                     364
                                                                                                                                                                                                                                                                                                                                                                               304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aagctgatcgaatacgacgaaaccgcgcgtcgcgccatggaggtcggcatggacaagctg
                                                                                                                                                                 alcgcgcaggtggcgacggtgtcctcgcgcgacgagcagatcggtgacctggttggcgaa
                                                                                                                                                                                                                                                               gccgacgcggtattcgaggcgctgctggcatcggccacgccggtgtccggcaagaccggc
                                                                                                                                                                                                                                                                                                                                                             gttgccggtgacggcaccaccaccgcaaccatcttggcgcaggcactgatcaagggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gatccgtttgaagacttgggcgcccagctggtgaagtcggtggccaccaagaccaacgat 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCCGACACCGTGAAGGTGACGATCGGCCC---CAAGGCGAACGTCGTCATCGACAAGAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccyacaccgtgcgggtgacgctggggccgcgcggcggcatgtggtggtggccaaggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAGATCCTGAAGTTCGACGAGGACGCCCGTCGCGCCCTCGAGCGCGCGTCAACAAGCTC 1234
                                               GCGATGGACAAGGTCGGCAAGGACGGTGTCATCACCGTCGAGGAGTCCAACACCTTCGGT
                                                                                                                                                                                                                                      GTCGCCGCCGTGTCGGAAGACCTTCTCGCCACCGCCCCCCGATCGACGACAAGTCCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                              ATCGCGGGTGACGGCACCACCGCCACCGTGCTCGCCCAGGCGCTCGTGCGCGAGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GACCCGTACGAGAACCTCGGCGCCCAGCTGGTGAAGGAGGTGGCGACCAAGACCAACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTCGGCGCCCCCACCATCACCAACGACGGCGTCACCATCGCCCGCGAGGTCGAGGTCGAG
                                                                     ATCGCCGCGTGGCCGCGCTGTCCGCCCAGGACCAGCAGGTCGGCGAGCTGATCGCCGAA
                                                                                                                                                                                                                                                                                                                                  CTGAAGAACGTCGCCGGTGCCTCCCCGGCGCTGCTGAAGAAGGGCATCGACGCGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="groEL1"
/product="GroEL1"
1169. 2791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RWIAENAGLEGYVITSKVADLDKGQGFNAATGEYGDLVKAGVIDPVKVTRSALENAAS
IASLLLTTETLVVEKKEEEEPPAAGGHSHGHSH"
1 1100 c 977 g 400 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APGFGDRRKAMLQDMAVLTGATVISEEVGLKLDQVGLEVLGTARRITVTKDDTTIVDG
AGKRDEVQGRIAQIKAEIENTDSDWDREKLQERLAKLAGGVCVIKVGAATEVELKERK
HRLEDAISATRAAVEEGIVSGGGSALVHAVKVLEGNLGKTGDEATGVAVVRRAAVEPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KNVAAGASPALLKKGIDAAVAAVSEDLLATARPIDEKSDIAAVAALSAQDQQVGELIA
EAMDKVGKDGVITVEESNTFGLELDFTEGMAFDKGYLSPYFVTDQERMEAVLDDPYIL
INQGKISSIADLLPLLEKVIQANASKPLLIIAEDLEGEALSTLVVNKIRGTFNAVAVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="groel1"
/product="Groel1"
/protein_id="GAA53019.1"
/protein_id="GAA53019.1"
/db_xref="GI:406598"
/db_xref="GI:406598"
/tanslation="MAKILKEDEDARRALERGVNKLADTVKVTIGPKANVVLDKKFGA
/translation="MAKILKEDEDARRALERGVNKLADTVKVTIGPKANVVLDKKFGA
/translation="MAKILKEDEDARRALERGVNKTNDIAGDGTTTATVLAQALVREGL
PTITNDGVTIAREVEVEDPYENGAGLVKEVATKTNDIAGDGTTTATVLAQALVREGL
PTITNDGVTIAREVEVEDPYENGAGLVKEVATKTNDIAGDGTTTATVAALGACOOVGELLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene='
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="01:809756"
/db_xref="SWISS-PROT:P40172"
/db_xref="SWISS-PROT:P40172"
/translation="MyTTYSKVAIKPLEDRIVYQPLDAEQTTASGLVIDDTAKEKPQE
GVVLAVGPGRFEDGNRLPLDVSVGDVVLYSKYGGTEVKYNGEEYLVLSARDVLAIVEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="groEL1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  43.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          groEL1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 708.4;
Pred. No. 1.9e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.9e-70;
ches 531;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 3000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                               1711
                                                                                                                                          1651
                                                                                                                                                                                          483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1351
                                                                                                                                                                                                                                      1591
                                                                                                                                                                                                                                                                                     423
                                                                                                                                                                                                                                                                                                                                  1531
                                                                                                                                                                                                                                                                                                                                                                                                                              1471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       183
                                                                                                                                                                                                                                                                                                                                                                               363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ω
••
```

accyagttggagttcaccgaaggtattggcttccacaaaggcttcttgtcggcatacttc

15	aaggcagaagatcacgaccatcaccacgggcacgcgcact 16 	2 H
1557 2725	1498 aggtcggcggtgttgaacgcgtcatcggttgcccgggatggtactcaccaccgagacggtc	2 1
1497 2665	1438 aacaccetgagetatggtgacttggcegetgaeggegteategaeceggteaaggtgaet	N 14
1437 2605	1378 gacggctcggtggtcggtcaacaaggtcagcgagctacccgcccg	N 14
1377 2545	1318 gacgtgttctccgaagcccttgccgcgccgttgttctggatcgccgccaacgctggcttg	N H
1317 2485	1258 gcccgcaaggcgctgaccgaactgcgtgcgtcgctgaccggtgacgaggtcctcggtgtc	6 1 ⊢
1257 2431	1198 gccaaggcegeggtegaggagggcategtecetggtgggggagcetegeteatecaceag	K1 144
1197 2371	1138 gccgccaccgacaccgcactcaaggagcgcaaggaaagcgtcgaggatgcgggcc 	K) ₩
1137 2311	1078 gaaaagcttggcgagcggctggccaaactggccggcggggttgctgtcatcaaggtgggt	K)
1077 2251	1018 gccaaccgggcgaaccacttgcgtgccgagatcgacaagagcgattcggattgggatcgg	K) had
1017 2191	958 gtggttggtcagcaaggacgacacggtcattgtcgacggcggcggcaccgcagaagcggtg 	N)
957 2131	898 cccgacgccggcattgtgctgcgcgaggtgggcttggaggtgctgggctcggcccgacgc	N)
897 2071	838 gaccgccgtaaggcgttccttgaggacctggcggttggtgacgggtggccacgtggtcaac	N)
837 2011	778 gtcgtcaacgcgattcgcaagacgttgaaagcggtcgcggtcaaggggccgtacttcggt	_
777 1951	718 acgggtaagccactactgatcgtggctgaagacgtggagggcgaagcgttggcgacgctg	_
717 1891	664 gacaagatcagctcgcttcccgatctgttgccattgctggaaaaggttgcagga	_
663 1831	604 gttaccgacttcgataaccagcaggcggtgctcgaggacgcgttgatcctgctacaccaa 	
1771		u

В

Search completed: January 12, 2001, 19:59:14 Job time: 26128 sec

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                            Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                        otal number of hits satisfying chosen parameters:
 SPTREMBL_15:*

1: sp_archea:*
2: sp_bacteria:*
3: sp_fungi:*
4: sp_human:*
5: sp_invertebrate
6: sp_mammal:*
7: sp_mhc:*
8: sp_organelle:*
9: sp_phage:*
10: sp_plant:*
11: sp_rodent:*
12: sp_vertebrate:
14: sp_unclassifie
                                                                                                                                                                                                                                                                                                                                                                                                                                                       374700 seqs, 117207915 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 January 5, 2001, 14:25:08; Search time 115.27 Seconds (without alignments) 547.045 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 SKLIEYDETARRAMEVGMDK......VVVDKPAKAEDHDHHHGHAH 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-461-774-2
2654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
sp_mammal:*
sp_mhc:*
sp_organelle:*
sp_phage:*
sp_plant:*
sp_rodent:*
sp_virus:*
sp_virus:*
sp_vertebrate:*
sp_unclassified:*
                                                                                                                                                                     sp_invertebrate:*
                                                                                                                                                                                                                                                                                                                                                                                                                        374700
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

16 17 18 19	55 5 5 6 6 7 7 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1	221	Result No.
1367.5 1365.5 1363.5 1355.5	1557.5 1525.5 1525.5 1420.5 1426.5 1423.5 1423.5 1405.5 1405.5 1405.5 1374.5	1642 1580.5	Score
51.5 51.5 51.4 51.1	58.7 56.9 53.8 53.6 53.6 53.6 53.6 51.8	59.6	% Query Match
540 540 540	544 544 544 544 544 544 544 644	л 5541 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	% Query Match Length
8888		งผผ	DB
Q9KKF0 Q57002 Q9KJV7 Q9KJ88	Q9KGWJ Q9KGWJ P97086 P97086 Q9K2U4 Q9KC20 Q9RC20 Q9RC44 Q9KFC3 Q9WYX6 Q9WYX6 Q9WYX6 Q9WYX6 Q9WYX6 Q9YCA9 Q9RCA9 Q9RCA9 Q9RCA9 Q9RCA9 Q9RCA9	086801 09KXU5	ID
O9kkf0 clostridium Q57002 syncchococc Q9kjy7 clostridium Q87888 lawsonia in	Ogkgwl mycobacteri P97086 tsukamurell Ogkzu4 propionibac Ograz0 bacillus sp Ogra44 thermus aqu Ogkfc3 bacillus ha Ogwyx6 thermotoga Ogyxa9 rhodothermu Ogrwp9 deinococcus Ogrwp9 deinococcus Ogy447 streptococc Ogz847 lactobacill	086801 streptomyce 09kxu5 streptomyce	Description

45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
1198.5	1213.5	1224.5	1224.5	1230.5	1237.5	1238.5	1249.5	1251.5	1254.5	1258.5	1265	1273	1276.5	1278	1288.5	1289	1291	1291.5	1292.5	1293.5	1296	1310.5	1322.5	1336	1345
45.2	45.7	46.1	46.1	46.4	46.6	46.7	47.1		47.3	47.4	47.7	48.0	48.1		•	48.6	•	48.7	48.7	48.7	48.8	49.4	49.8	50.3	50.7
530	530	497	481	503	497	497	548	548	457	555	544	547	548	550	544	546	544	544	538	540	540	547	543	477	542
N	æ	N	Ŋ	N	N	N	N	N	N	N	N	N	N	2	N	Ν	N	N	2	N	N	N	N	N	N
Q9KLC6	Q9TLZ1	Q9X4G4	033733	087271	Q9X4G5	Q9S6B0	008500	008499	Q9KI57	Q9X603	Q9X6Y3	Q9XAU7	Q9L7P5	Q9S303	Q9KNR7	Q9ZN50	Q9L690	Q9JQ79	033688	Q9WWL4	068324	Q9PFP2	Q9KJ23	033658	Q9L691
	Q9tlz1 cyanidium c		O33733 streptococc	O87271 bartonella		Q9s6b0 chlamydia p	008500 sitobion av			Q9x603 primary end	Q9x6y3 bacteroides		Q917p5 vibrio para	Q9s303 rickettsia	Q9knr7 vibrio chol	Q9zn50 helicobacte			-		068324 lactobacill		_	O33658 streptomyce	Q91691 rhizobium 1

ALIGNMENTS

3000000 R R R	R A A A R A R A A A A A A A A A A A A A	R R R R R R R R R R R R R R R R R R R	00000 E	RESULT O86801 ID C AC C DT 0 DT 0
-!- FUNCTION: PREVENTS MISPOLDING AND PROMOTES THE REFOLDING AND PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER STRESS CONDITIONS (BY SIMILARITY)!- SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED OF TWO STACKED RINGS OF 7 SUBUNITS (BY SIMILARITY)!- SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY. EMBL; ALO31317; CAA20418.1; HSSP; P66139; 1JON. INTERPRO; IPRO01844;	IN=A3 INE=9 INE=9 INE=9 INE=9 INE=9 INE=9 INE=9 INE=9 INE=9 INE=1	SEQUENCE FROM N.A. STRAIN=A3(2); STRAIN=A3(2); Submitted (AUG-1998) to the EMBL/GenBank/DDBJ databases. [2] STRAIN=A3(2); STRAIN=A3(2); STRAIN=A3(2); Submitted (AUG-1998) to the EMBL/GenBank/DDBJ databases.	60) NA CHAPEKONIN (PROTEIN CROOD) (GROEL PROTEIN) (HEAT SHOCK PROTEIN 60). GROEL1. Streptomyces coelicolor. Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces. MCBI_TaxID=1902;	1 86801 PRELIMINARY; PRT; 541 AA. 86801; 86801; 1-NOV-1998 (TrEMBLrel. 08, Created) 11-NOV-1998 (TrEMBLrel. 08, Last sequence update) 11-OCT-2000 (TrEMBLrel. 15, Last annotation update) 11-CCT-2000 (TrEMBLrel. 15, Last annotation update)

```
RESULT OPERATE OF THE PROPERTY OF THE PROPERTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρý
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SQ DR DR SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Ma
Best Loc
Matches
        STRAIN=A3(2);
Seeger K.J., H
Submitted (MAY
[2]
                                                                                                                                                                                                                                                                   Q9KXU5;
Q1-QCT-2000
Q1-QCT-2000
Q1-QCT-2000
                                                                                                                               GROEL2.
Streptomyces coelicolor.
Streptomyces coelicolor.
Streptomyces coelicolor.
Streptomycetaceae;
                                                                                                                                                                                                                                             01-OCT-2000 (Tremblrel. 01-OCT-2000 (Tremblrel. 01-OCT-2000 (Tremblrel. CHAPERONIN 2.
                                                                                                                                                                                                                                                                                                                                                         Q9KXU5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO; IPRO02423;

PPAM; PF00118; CPD60_TCP1; 1.

PRINTS; PR00298; CHAPERONINGO.

PRINTS; PR00304; TCOMPLEXTCP1.

PROSITE; PR00304; TCOMPLEXTCP1.

Chaperone; PS00296; CHAPERONINS_CPN60;
Chaperone; ATP-binding.

Chaperone; ATP-binding.
                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      y Match
Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Н
                                                                                                                                                                                                                                                                                                                                                                                                 N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAED--HDHHHGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKV--A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HS .. |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AVK--VLEGNLGKTGDEATGVAVVRRAAVEPLRWIAENAGLEGYVITSKVADLDKGQGFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REKLQERLAKLAGGVCVIKVGAATEVELKERKHRLEDAISATRAAVEEGIVSGGGSALVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GLELDFTEGMAFDKGYLSPYFVTDQERMEAVLDDPYILINQGKISSIADLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AATGEYGDLVKAGVIDPVKVTRSALENAASIASLLLTTETLVVEKKEEEEPAAGGHSHGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AVAAVSEDLLATARPIDEKSDIAAVAALSAQDQQVGELIAEAMDKVGKDGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EDPYENLGAQLVKEVATKTNDIAGDGTTTATVLAQALVREGLKNVAAGASPALLKKGIDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                              J., Harris
(MAY-2000)
                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                    D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61.9%;
                                 ťo
                            the
                                                                                                                                                                                                                                                                   15,
15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    92;
                                                                                                                                                                                                                                                                 Created)
Last sequ
Last anno
                            EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1642; DB 2;
Pred. No. 1.9e-76;
2; Mismatches 117;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C2EFED580B33FFD8
                                                                                                                                                                                                                                                                   sequence up
annotation
                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                       A
                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                 update)
                              databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                       Streptomyces.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ψ
```

```
RESULT
033659
AC DT DT DT DT RN RP
                                                                                                                                                                                     δõ
                                                                                                                                                                                                         ₽
                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                         Д
                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match 59.6%;
Best Local Similarity 60.9%;
Matches 321; Conservative
     O33659

O33659;
O33659;
O1-JAN-1998 (TrEMBLrel. 05, Cr
O1-JAN-1998 (TrEMBLrel. 13, La
O1-MAY-2000 (TREMBLrel. 13, La
O6 KDA CHAPERONIN (PROTEIN CPN
O6);
GROELI.
Streptomyces lividans.
Bacteria; Firnicutes; Actinoba
Actinomycetales; Streptomycine
NCBI_TaXID=1916;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN=A3(2);
Redenbach M., Kieser H.M., Denapait Kinashi H., Hopwood D.A.;
"A set of ordered cosmids and a det the 8 Mb Streptomyces coelicolor Aimol. Microbiol. 21:77-96(1996).
EMBL: A1357432: CAB93056.1; "...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN=A3(2);
Cerdeno A.M.,
Submitted (MAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM
                                                                                                                                                                     479
                                                                                                                                                                                       481
                                                                                                                                                                                                         421
                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                     242
                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                         182
                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                             122
                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ۲
                                                                                                                                        ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA
                                                                                                                                                                                                                                          GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                           TGEYVDMIAEGIIDPAKVTRSALQNAASIAALFLTTEAVIADKPEKA
                                                                                                                                                                                                        SQVFEKL--ELTGDEATGANAVKLALEAPLKQIAVNGGLEGGVVVEKVRNLTVGHGLNAA
                                                                                                                                                                                                                   RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                        GLELELTEGMRFDKGYISAYFATDMERMEASLDDPYILIANSKIGNVKDLLPLLEKVMQS
                                                                                                                                                                                                                                                                                                                                                                                                                                EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVKEGLRNVAAGANPMALKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                         EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (MAY-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Parkhill J., Barrell B.G.,
                           Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        56829
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ő
                        Actinobacteria; Actinobacteria ptomycineae; Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   , ; .
                                                                    , Created)
, Last sequence update)
, Last annotation update)
CPN60) (GROEL PROTEIN) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Denapaite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1580.5;
Pred. No. 2.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a detailed genetic a lor A3(2) chromosome.
                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       26BD7E89A9CB81C5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             D.,
                      Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2.6e-73;
                                                                                                                     A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eichner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rajandream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ВВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
e.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Α.,
                                                                        (HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           M.A.;
                                                                                                                                                                     525
                                                                                                                                                                                       527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          physical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cullum
                                                                        SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for
```

٠,

2

```
g
                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γ
                                                                                                                                            В
                                                                                                                                                           δ
                                                                                                                                                                                  В
                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                     ρ
                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                         뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query
Best 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
Q9KGW1 PRELIMINARY; PRT; 541 AA. Q9KGW1; Q9KGW1; O1-OCT-2000 (TrEMBLrel. 15, Created) O1-OCT-2000 (TrEMBLrel. 15, Last sequence update) O1-OCT-2000 (TrEMBLrel. 15, Last annotation updat HEAT SHOCK PROTEIN HSP65 (FRAGMENT). Mycobacterium avium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Streptomyces lividans groES, groEL1 and groEL2 genes.";
Microbiology 143:3563-3571(1997).
-i-FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING
PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER
CONDITIONS (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chaperone;
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HSSP; P06139; 1GRL.
INTERPRO; IPR001844; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=98048481;
de Leon P., Marco
Mellado R.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7 SUBUNITS (BY SIMILARITY)
-!- SIMILARITY: BELONGS TO THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <del>-</del>;
                                                                                                                                             421
                                                                                                                                                               419
                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                        121
                                                                                                         479
                                                                                                                                                                                  361
                                                                                                                                                                                                     359
                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                239
                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
                                                                                                                                                                                                                                                                                                                                                                                                                   N
                                                                                                                                                                                                                                                                                                                                                                                                                           Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED
                                                                                                                VNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                                                                     REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH
                                                                                                                                                                                                                                  NPDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWD
                                                                                                                                                                                                                                                                                                            GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKV--A
                                                                                                                                                                                                                                                                                                                                                                           AKILKFDEDARRALERGVNKLADTVKVTIGPKA-NVVIDKKFGPPTITNDGVTIAREVEV
                                                                                                       AATGEYGDLVKAGVIDPVKVTRSALENPASIASLLLTTETLVVEK--KEEEEPAAGGHSH
                                                                                                                                             AVK--VLEGNLGKTGDEATGVAVVRRAAVEPLRWIAENPGLEGYVITSKVADLDKGQGFN
                                                                                                                                                                                 REKLQERLAKLAGGYCVIKVGAATEVELKERKHRLEDAISATRAAVEEGIVSGGGSALVH
                                                                                                                                                                                                                                                                                                  GLELDFTEGMAFDKGYRLRLLRTDQERMEAVLDDPYILINQGKISSIADLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 X95970; CAA65225.1; P06139; 1GRL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATP-binding.
541 AA; 57309 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BELONGS TO THE CHAPERONIN (HSP60) FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PubMed=9387235;
S., Isiegas C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58.8%;
58.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Isiegas C., Marina
                                                                                                                                                                                                                                                                                                                                                                                                                                                       92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1561.5;
Pred. No. 2.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      90A55824708EC826
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                5; DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                        124;
                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Carrascosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TWO
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4
                                                                                                                                                                                                                                                                                                                                                                                                                                                       7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                               478
                                                                                                                                                                                  420
                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                         358
                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                               298
                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                       4.
```

```
Š
                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SO BELL
                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                      P97086;
01-MAY-1997 (TrEMBLrel. 03, Created)
01-MAY-1997 (TrEMBLrel. 03, Last sequence update)
01-MAY-2000 (TrEMBLrel. 13, Last annotation update)
01-MAY-2000 (TREMBLREL. 13, Last annotation update)
00. KDA CHAPERONIN (PROTEIN CPN60) (GROEL PROTEIN) (
                                                     Tsukamurella tyrosinosolvens.
Bacteria; Firmicutes; Actinobacteria;
Actinomycetales; Corynebacterineae; Ts
                                                                                       HSP60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (JUN-2000) to the EMBL; AF281650; AAF91444.1; NON_TER 541 541 SEQUENCE 541 AA; 56577 MV
SEQUENCE FROM N.A.
STRAIN=IMMIB D-1411;
Zimmermann O., Pinkenburg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; MCBI_TaxID=1764;
                                            NCBI_TaxID=57704;
                                                                                                                                                                 P97086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A. Nagabhushanam V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Molecular
                                                                                                                                                                                                                       479
                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                              362
                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                  242
                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                            182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
nes 320; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hsp65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ш
                                                                                                                                                                                                                      RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                      KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                            GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IPALDELK -- LEGDEATGANIVRVALEAPLKQIAFNGGLEPGVVAEKVHNSPAGTGLNAA
                                                                                                                                                                                                                                                                                                                                                      EVGLSLESADISLLGKARKVVVTKDETTIVEGAGDSDAIAGRVAQIRTEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                  GKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVTSE
                                                                                                                                                                                                                                                                                                                                                                                                                                           GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEDPFILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     {\tt AVEKVTETLLKSAKEVETKDQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                           KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALLH-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and immunological
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Praszkier
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               58.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1557.5;
Pred. No. 3.9e
76; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 J., Cheers C.;
l characterization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL/GenBank/DDBJ
                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           65075FAF2AF2E8B6
                                                      Tsukamurellaceae;
                                                                                                                                                                 539
                                                                  Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5; DB
.9e-72;
                                                                                                                                                                 Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the
                                                                                                           (HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                       525
                                                                                                                                                                                                                                            527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ≾
                                                       Tsukamurella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 avium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω
••
                                                                                                             PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 homolog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18C
```

0.,

Koechel

```
RESULT
Q9K2U4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7 SUBUNITS (BY SIMILARITY).

-|- SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) |

EMBL; U90204; AAB49990.1; -.

HSSP; P06139; IGRL.

INTERPRO; IPR001844; -.

INTERPRO; IPR002423; -.

INTERPRO; IPR002423; -.

PRINTS; PR00118; CP160_TCP1; 1.

PRINTS; PR00298; CHAPERONIN60.

PRINTS; PR00304; TCOMPLEXTCP1.

PROSITE; PS00296; CHAPERONINS_CPN60; 1.

PROSITE; PS00296; CHAPERONINS_CPN60; 1.

PROSITE; PS00296; CHAPERONINS_CPN60; 1.

PHAEL Shock; Chaperone; ATP-binding.

SEQUENCE 539 AA; 56136 MW; 6335314830C9B662 CR0
                                                                      01-0CT-
01-0CT-
01-0CT-
01-0CT-
                 Propionibacterium acnes.
Bacteria; Firmicutes; Ac Actinomycetales; Propion
                                                                                                                                           Q9K2U4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (FEB-1997) to the EMBL/GenBank/DDBJ dat
-!- FUNCTION: PREVENTS MISFOLDING AND PROMOTES TH
PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENE
CONDITIONS (BY SIMILARITY).
-!- SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED OF
7 SUBUNITS (BY SIMILARITY).
     Propionibacterium
                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                418
                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                             478
                                                                                                                                                                                                                                                                                                                      362
                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Match
                                                                                                                                                                    6
                                                                                                                                                                                                          KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                         GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                QSGTVFDSXALEGDEATGANIVKVALDAPVKQIAVNAGLEPGVVAEKVRNSPAGTGLNAA
                                                                                                                                                                                                                                                                                                                     KLQERLAKLAGGVAVIKAGAATED-LKERKHRIEDAVRNAKAAVEEGIVAGGGSSL---A
                                                                                                                                                                                                                                                                                                                                                                                                    DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLFDLLFLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                               GKPLAIIAEDVEGEALVTLIVNKIRGTFKSVAIKAPGFGDRRKAMLQDMAILTGGQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AVEAVTEHLLKAAKEVETKDQIAATAGISAGDPAIGELIAEAMDKVGKEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                          OR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GLQLELTEGMRFDKGFISGYFATDAERQEAVLEDPYVLLVSGKISTVKDLLPLLEKVIQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AKTIAFDKKARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         al Similarity
316; Conser
                                                        GROEL.
                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                 propionibacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      57.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   to the EMBL/GenBank/DDBJ databases TS MISFOLDING AND PROMOTES THE REFO OF UNFOLDED POLYPEPTIDES GENERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TO THE CHAPERONIN (HSP60) FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1525; DE
Pred. No. 1.8e:
78; Mismatches
               Actinobacteridae;
Propionibacteriaceae;
                                                                                                                                         ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .8e-70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TWO STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFOLDING
                                                                                                                                                                                                             524
                                                                                                                                                                                                                                     527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2
 RESULT Q9RC210 1D Q9RC210 Q9 AC Q9 DT 011 DT 011 DE CF GN CF GN CF GN CF Ba OC Ba OC Ba OX NC
                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match 56.9
Best Local Similarity 57.8
Matches 303; Conservative
CPN60.
Bacillus sp. MS.
Bacteria; Firmicutes; Bac
Bacillus/Staphylococcus g
NCBI_TaxID=96470;
                                                                  Q9RC20
Q9RC20;
Q1-MAY-2000
Q1-MAY-2000
Q1-QCT-2000
CPN60.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Cloning acnes.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
Cho Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (JAN-2000) to the EMBL; AB036414; BAA92382.1; EMBL; AF222061; AAF33788.1; Heat shock.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=1747; [1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Farrar M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-P37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Propionibacterium ac
Submitted (DEC-1999)
                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                422
                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                          479
                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N
                                                                                                                                                                                                                      TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP
                                                                                                                                                                                                                                                                                                                   GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AKLIEFNIEARRGLEAGMNTLADAVKVTLGPKGRNVVLEKSWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                          NDEYVDMVEAGIIDPAKVTRSALQNAASIAALFLTTEAVIADKP
                                                                                                                                                                                                                                                                KAAEIE--
                                                                                                                                                                                                                                                                                         RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                   DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                               GKPLFVIAEDVEGEALAGLIVNKIRGTFKSVAVKAPGFGDRRKAMLNDIAILTGGQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GLELELTEGMRFDKGYISPYFVTDTERMEAVLEDPYILIVNSKISSLKDLLPVLEKVMQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQAMVREGLRNVTAGANPMGLKKGIEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AVQAVSARLSDMAIDIETKDQIASTASISAADPTVGEIIAEAMDKVGKEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FROM N.A.
                                                                                  ) (TrEMBLrel. 13,
) (TrEMBLrel. 13,
) (TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ingham E., sequencing
                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                               -GLEGDELTGAQIVLAACTAPLKQIAINAGLEGGVVAEKVAGLPAGQGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            acnes hsp60 gene.";
)) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         56839 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    56.9%;
               Bacillus/Clostridium us group; Bacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Holland of a gro
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         86;
                                                                                Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 1509.5; |
Pred. No. 1.1e-
36; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and K.T.;
groEL homolog
                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9B4314A8BF8A94DC
                                                                                                                                         539
                                                                                                                                        A
                            group,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DВ
                                                                                  update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Propionibacterium
                                                                                                                                                                                                                                     524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  544;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                478
                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
```

1;

Дb Ωy

δÃ

Дb

В

γQ

밁 δ g Š В Q В δÃ В Ş

*

```
RESULT
OPRA44
ID Q9
AC Q9
AC Q9
DT 0
DT 0
DT 0
DT 0
OC T
OC T
RN
RP
RC
                                                                                                                                                                                   ρy
                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                        ģ
                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                80
                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                            Q9RA44;
01-MAY-2000
01-MAY-2000
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO; IPRO01844; -.
INTERPRO; IPRO02423; -.
INTERPRO; IPRO02423; -.
PRAM; PF00118; cpn60_TCP1; 1.
PRAM; PF00118; CHAPERONIN60.
PRINTS; PR00296; CHAPERONINS_CPN60; 1.
PROSITE; PS00296; CHAPERONINS_CPN60; 1.
PROSITE; PS00296; CHAPERONINS_CPN60; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              [1]
SEQUENCE FROM N
STRAIN=MS;
                                                           CPNL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Kondo A.,
"Cpn60/10
  SEQUENCE FROM STRAIN-HB27;
                                     Thermus aquaticus (subsp. ther Bacteria; Thermus/Deinococcus
                                                                    01-MAY-2000 (TrEMBLrel.
01-MAY-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
CHAPERONIN-60.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL;
HSSP;
                                                                                                                   Q9RA44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Cpn60/10 from Bacillus strain MS.";
Submitted (JUN-1999) to the EMBL/GenBank/DDBJ databases
EMBL; AB028452; BAA88110.1; -.
                              NCBI_TaxID=274;
                                                                                                                                                                   479
                                                                                                                                                                                     481
                                                                                                                                                                                                        422
                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                           362
                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                            182
                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                  122
                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
Local Similarity 54...
287; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                        62
                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ν
                                                                                                                                       00
                                                                                                                                                                            TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP
                                                                                                                                                                                                               RKALTELRASITGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                         GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                     GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                           AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                      TGEWVDMIEAGIVDPTKVTRSALQNAASVAAMFLTTEAVVADKP
                                                                                                                                                                                                                                                                                 ELGRELKSATIASLGRASKVVVTKENTTIVDGAGDSERIKARINQIRAQLEETTSEFDRE
                                                                                                                                                                                                                                                                                                                     GKPLLIIAEDIEGEALATLVVNKLRGTFTAVAVKAPGFGDRRKAMLEDIAILTGGEVISE
                                                                                                                                                                                                                                                                                                                                                          TTELDVVEGMQFDRGYVSPYMITDTEKMEAVLENPYILITDKKISNIQDILPILEQVVQQ
                                                                                                                                                                                                                                                                                                                                                                                                 AVAVAVEELKAISKPIKGKESIAQVAAISAADEEVGQLIAEAMERVGNDGVITLEESKGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AKEIKFSEEARRAMLRGVDKLADAVKVTLGPKGRNVVLEKKFGSPLITNDGVTIAKEIEL
                                                                                                                                                                                                       NKVAA---IEAEGDEATGVKIVLRAIEEPVRQIAQNAGLEGSVIVERLKTEKPGIGFNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                P06139; 1JON.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Yohda
                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53.8%;
                                                                             13,
13,
                                               thermophilus)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94;
                                                                             Last sequence update)
Last annotation updat
                                                                                                Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 1427.5; DB 2;
Pred. No. 1.7e-65;
4; Mismatches 140;
                                       group;
                                                                                                                   PRT;
                                       Thermus
                                                                                                                   543
                                                                                                                   ₿
                                       group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ۲.
```

Q9KFC3; Q9KFC3; 01-OCT-2000 01-OCT-2000 01-OCT-2000

PRELIMINARY;

PRT;

544

A

T-2000 (TrEMBLrel. 15, T-2000 (TrEMBLrel. 15, T-2000 (TrEMBLrel. 15, I HEAT-SHOCK PROTEIN

Last sequence up Last annotation (CHAPERONIN). Created)

update)

update)

۵

CLASS

GROEL

Bacillus halodurans.

Bacteria; Firmicutes; Bacillus/Staphylococcus

Bacillus/Clostridium

group;

group;

Bacillus

NCBI_TaxID=86665;

SEQUENCE FROM N.A. STRAIN=C-125 / JCM Takami H., Nakasone

9153; ×.

Nakasone

Takaki

```
밁
                                                                     δÃ
                                                                                                 밁
                                                                                                                      Qy
                                                                                                                                                  В
                                                                                                                                                                       QΥ
                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                 δÃ
 ď
                 δõ
                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local S
Matches 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Characterization of the cpn10-cpn60 chaperonine from The thermophilus HB27.";
L Submitted (OCT-1999) to the EMBL/GenBank/DDBJ databases.
R EMBL; AJ250409; CAB65482.1; -.
R HSSP; P45746; 1SRV.
R INTERPRO; IPR001844; -.
R INTERPRO; IPR002423; -.
R PFAMM; PF00118; cpn60_TCP1; 1.
R PFAMM; PF00118; CPn60_TCP1; 1.
R PFAMM; PF00298; CHAPERONING0.
R PRINTS; PR000298; CHAPERONING0.
R PRINTS; PR000296; CHAPERONINS_CPN60; 1.
R PRINTS; PR000296; CHAPERONINS_CPN60; 1.
SEQUENCE 543 AA; 57872 MW; D333586CC2A95FBF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Boskocik J., Moreno R., Valpuesta J.M., "Characterization of the cpn10-cpn60 cha
 480
                       478
                                                 421
                                                                          421
                                                                                                  362
                                                                                                                                                   302
                                                                                                                                                                           301
                                                                                                                                                                                                      242
                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                      <u>س</u>ـ
                                                                                               GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                    SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
           NVNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAE
                                                                                                                                                  ELGFKLENATLSMLGRAERVRITKDETTIVGGKGKKEDIEARINGIKKELETTDSEYARE
                                                                                                                                                               AADAVEEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                        EDPFEDLGAQLVKSVATKINDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                            AKILVFDEAARRALERGVNAVANAVKVTLGPRGRNVVLEKKFGSPTITKDGVTVAKEVEL
NAATGEFVDMVEAGIVDPAKVTRSALQNAASIGALILTTEAVVAEKPEKKE
                                              ISAVEELIKKLEGDEATGAKIVRRALEEPARQIAENAGYEGSVIVQQILAETKNPR-YGF
                                                              RKALTELRASLIGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKV---SELPAGHGL
                                                                                                                                                                                                   GKPLLIIAEDVEGEALATLVVNKLRGTLSVAAVKAPGFGDRRKEMLKDIAAVTGGTVISE
                                                                                                                                                                                                                                                                                                         AVEAAVEKIKAPAIPVEDRKAIEEVATISANDPEVGKLIADAMEKVGKEGIITVEESKSL
                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        53.7%; Score 1426.5; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                            100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Berenguer J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Thermus
                       528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     543;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                 420
                                                                                                                                                   361
                                                                                                                                                                           360
                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                   301
```

 $_{\cdot}^{\omega}$

```
В
δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                           БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                    Q9WYX6;
01-NOV-1999
01-NOV-1999
01-OCT-2000
60 KDA CHAPEI
                                      SEQUENCE FROM N.A.

STRAIN-MSB8 / DSM 3109;

MEDLINE-9287316; PubMed-10360571;

Nelson K.E., Clayton R.A., Gill S.R., Gwinn M.L., Dodson R.J.,

Nelson K.E., Clayton R.A., Gill S.R., Nelson W.C., Ketchum K.A.,

Haft D.H., Hickey E.K., Peterson J.D., Nelson W.C., Ketchum K.A.,

McDonald L., Utterback T.R., Malek J.A., Linher K.D., Garrett M.M.,

Stewart A.M., Cotton M.D., Pratt M.S., Phillips C.A., Richardson D.,

Heidelberg J., Sutton G.G., Fleischmann R.D., Eisen J.A., White O.,

Salzberg S.L., Smith H.O., Venter J.C., Fraser C.M.;

"Evidence for lateral gene transfer between Archaea and Bacteria fror
                     genome sequence of Thermotoga maritima.";
Nature 399:323-329(1999).
                                                                                                                                                                                                                                                                                                                                        Q9WYX6
                                                                                                                                                                                                                Bacteria;
                                                                                                                                                                                                                             Thermotoga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Submitted (MAR-2000) to the EMBL/GenBank/DDBJ databases. EMBL; AP001508; BAB04281.1; -. SEQUENCE 544 AA; 57403 MW; C769ED81C903C971 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local 281;
                                                                                                                                                                                                                                                                                                                                                                                                         479
                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <u>,,,</u>
                                                                                                                                                                                                                                                                                                                                                                                                                        TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGEWVNMVEAGIVDPTKVTRSALQHAASVSAMFLTTEAVIADKPEENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                              IKAVSSIGAE--GDEATGVNIVLRALEEPVRQIAHNAGLEGSVIVERLKKEEAGFGFNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKPILIIAEDVEGEALATLVVNKLRGTFNAVAVKAPGFGDRRKAMLEDIAILTGGEVITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STELEVVEGMQFDRGYASPYMVTDSDKMEAVLDNPYVLITDKKISNIQEVLPVLEQVVQQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATQVAVEELSKISKPIEGKDSIAQVAAISSADDEVGKIIAEAMERVGNDGVITIEESKGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AKDIKFSEDARRSMLRGVDKLADAVKVTLGPKGRNVVLEKKFGSPLITNDGVTIAKEIEL
                                                                                                                                                                                                                                                                    -1999 (TrEMBLrel. 12, Created)
-1999 (TrEMBLrel. 12, Last sequence update)
-2000 (TrEMBLrel. 15, Last annotation update)
-CHAPERONIN (PROTEIN CPN60) (GROEL PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                               Thermotogales;
                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       53
        MISFOLDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Thermotoga.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
        AND PROMOTES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1423.5; DB
No. 2.8e-65;
                                                                                                                                                                                                                                                                                                                                        538
                                                                                                                                                                                                                                                                    cion update)
PROTEIN) (F
                                                                                                                                                                                                                                                                                                                                        Ą
        THE
                                                                                                                                                                                                                                                                    (HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
        REFOLDING
                                                                                                                                                                                                                                                                                                                                                                                                           526
                                                                                                                                                                                                                                                                       SHOCK PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2
```

```
Q
                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                           O9XCA9 PRELIMI
O9XCA9;
O1-NOV-1999 (TrEMBI
O1-NOV-1999 (TrEMBI
O1-OCT-2000 (TrEMBI
O0 KDA CHAPERONIN (
Rhodothermus marinus.
Bacteria; CFB group;
NCBI_TaxID=29549;
[1]
                                                                   60)
                                                     GROEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO; IPRO01844; ...
INTERPRO; IPRO02423; ...
PFAM; PF00118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONINGO.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Chaperone;
                                                                                                                                                                                                                481
                                                                                                                                                                                                                                         480
                                                                                                                                                                                                                                                                   422
                                                                                                                                                                                                                                                                                                                      363
                                                                                                                                                                                                                                                                                                                                                                         303
                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                           243
                                                                                                                                                                                                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SUBUNIT: OLIGOMER OF 14 SUBUNITS 7 SUBUNITS (BY SIMILARITY).
SIMILARITY: BELONGS TO THE CHAPEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROPER ASSEMBLY OF UNFOLDED CONDITIONS (BY SIMILARITY).
                                                                                                                                                                                                             NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAED
| :: |:|| ||||| ::|:|| ::|:|| :::
LRGEYCNMFERGIIDPAKVTRSALQNAASIAGMLLTTEVLIVEKPEEKKE
                                                                                                                                                                                                                                                                                                                                                                                                                                         KPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIELE
                                                                                                                                                                                                                                                                   KAVEKVIEELEGDEKIGAQIVYKALSAPIKQIAENAGYDGAVIIEKILSNDDPA-YGFDA
                                                                                                                                                                                                                                                                                          KALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKV--SELPAGHGLNV
                                                                                                                                                                                                                                                                                                                                    LGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQAR
                                                                                                                                                                                                                                                                                                                                                                         LGINLEDLTLEDLGRADLVRVKKDETIIIGGKGDPEAIKKRIAQIKAQIEETTSEYEKET
                                                                                                                                                                                                                                                                                                                                                                                                 AGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDREK
                                                                                                                                                                                                                                                                                                                                                                                                                           KPLLVIAEDVEGEVLTTLVLNKLKGTLQSCAVKAPGFGERRKAMLQDIAILTGGQVASEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYVEFTEGMQFDRGYISPYFVTDAEKMEVVLKEPFILITDRKLSAVKPLIPILEKVAQTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VEKAVEEIKKVSKKLSGREDIAHVAAISANSAEIGELIAEAMDKVGEDGVITVEDSKTLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DKFENLGAQLVKEVASKTNDVAGDGTTTATVLAQAMIKEGLKNVAAGANPILLKRGIDKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGKA 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KILKFNEEARRALERGVDKVANAVKVTLGPKGRNVVIEKSWGSPTITNDGVSIAKEIELE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTLG
                                                                                                                                                                                                                                                                                                                      LQERMAKLAGGVAVIKVGAATETELKEKKHRIEDALSATRAAVEEGIVPGGGVTLL-RAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TM0506;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AE001727; AAD35591.1;
P45746; 1SRV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATP-binding.
538 AA; 58065 MW;
                                                                           (TrEMBLrel. 12, Created)
(TrEMBLrel. 12, Last sequence update)
(TrEMBLrel. 15, Last annotation update)
GRONIN (PROTEIN CPN60) (GROEL PROTEIN) (
                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       53.6%;
                           Rhodothermus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1422; DB 2; Pred. No. 3.3e-65;
                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             193F1ACCCE45F813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CHAPERONIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POLYPEPTIDES
                          group;
                                                                                                                                                540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPOSED
                                                                                                                                              Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (HSP60)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERATED UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OMI
                                                                              (HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STACKED
                                                                                                                                                                                                               530
                                                                                                                                                                                                                                         529
                                                                               SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRESS
                                                                                 PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                       362
                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q.
```

ω

٠,

```
RESULT
Q9RWQ9
ID QS
AC QS
DT 01
DT 01
                                                                                                                    δ
                                                                                                                                                  В
                                                                                                                                                                       δõ
                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                        δÕ
                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
Q9RWQ9;
Q9RWQ9;
01-MAY-2000
01-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERPRO; IPR002423; -...

PFAM; PF00118; cpn60_TCP1; 1.

PRINTS; PR00298; CHAPERONING.

PRINTS; PR00304; TCOMPLEXTCP1.

PROSITE; PS00296; CHAPERONINS_CPN60; 1.

Heat shock; Chaperone; ATP-binding.

SEQUENCE 540 AA; 57666 MW; 6867448B7BEF18EC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the groESL, dnak and dnaJ genes.";
Submitted (APR-1999) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER CONDITIONS (BY SIMILARITY).
-!- SUBUNIT: OLICOMER OF 14 SUBUNITS COMPOSED OF TWO STACKED 7 SUBUNITS (BY SIMILARITY).
-!- SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
EMBL; AF145252; AAD37976.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Thorbjarnardottir S.H., Palsdottir A., Hauksdottir H., Kristjansdottir S., Eggertsson G.; "Heat shock in Rhodothermus marinus: Cloning and seque the groESL, dnak and dnaJ genes.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Thorolfsdottir E.T.T., Backman V.M., Blondal T.,
                                                                                                                                                    422
                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                          123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-ITI 376;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                  481
                                                                                                                                                                                                     363
                                                                                                                                                                                                                             360
                                                                                                                                                                                                                                                      303
                                                                                                                                                                                                                                                                                                      243
                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                         183
                                                                                                                           480
                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                 QTEEFGNLLEQGVIDPTKVARTALENAASVAGLLLTTEAVVAEKPEK
                                                                                                               NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK
                                                                                                                                                                                                                                                                   PDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDR
                                                                                                                                                                                                                                                                                                                     TGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVN
                                                                                                                                                                                                                                                                                                                                                        TETTLEVVEGMQFDRGYLSPYFVTNPDTMEAVLEDAYILIHDKKISAMKDLLPILEKVVQ
                                                                                                                                                                                                                                                                                                                                                                                                         AVEVVVAELRKMSQEVQDKNRIAQVATISANGDKAIGQLIADAFEKVGKDGVITVEEAKG
                                                                                                                                                                                                                                                                                                                                                                                                                      AADAVFEALLASATPVSGKTGIAQVATVSSR-DEQIGDLVGEAMNKVGHDSVVSVKESST
                                                                                                                                                    AIAALDKVEVE-NEDQKIGVQIVQRALEEPLRQIAANAGWEGSIVVQRVKEGQGDFGFNA
                                                                                                                                                                          ARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNV
                                                                                                                                                                                                                                                                                                     TGRPLLITAEDVEGEALATLVVNKLRGVLKVAAVKAPGFGDRRKAMLEDIAILTGGTVIS
                                                                                                                                                                                                                                                                                                                                                                     LGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AKQITFNADARMALKRGVDKLADAVKVTLGPKGRNVIIEKKFGAPTVTKDGVTVAKEIEL
                                                                                                                                                                                                                                                     EEKGYRLENATLDYLGQAERIIVDKDNTTIVGGKGDPAQIKARANQIRQQIEETTSDYDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IPR001844; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
(TrEMBLrel.
                                    PRELIMINARY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       53.0%;
13,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          87;
Created)
Last seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1405.5;
Pred. No. 2.36
                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
sequence update)
                                    548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .5; DB
2.3e-64;
                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           146;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                  527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     analysis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ω
``
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                    480
                                                                                                                                                                                                    421
                                                                                                                                                                                                                             419
                                                                                                                                                                                                                                                      362
                                                                                                                                                                                                                                                                             359
                                                                                                                                                                                                                                                                                                     302
                                                                                                                                                                                                                                                                                                                               299
                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                         182
                                                                                                                                                                                                                                                                                                                                                                                                                                  179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ψ
```

```
밁
                      Qγ
                                                      밁
                                                                              Qy
                                                                                                              Вþ
                                                                                                                                      Qy
                                                                                                                                                                     В
                                                                                                                                                                                            Qy
                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-20036896; PubMed=10567266;
White O., Elsen J.A., Heidelberg J.F., Hickey E.K., Peterson J.D., Modson R.J., Haft D.H., Gwinn M.L., Nelson W.C., Richardson D.L., Moffat K.S., Qin H., Jiang L., Pamphile W., Crosby M., Shen M., Moffat K.S., Qin H., Jiang L., Pamphile W., Crosby M., Shen M., Vamathevan J.J., Lam P., McDonald L., Utterback T., Zalewski C., Vanathevan J.J., Lam P., McDonald L., Winton K.W., Fleischmann R.I. Makarova K.S., Aravind L., Daly M.J., Minton K.W., Fleischmann R.I. Ketchum K.A., Nelson K.E., Salzberg S., Smith H.O., Venter J.C., Fraser C.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INTERPRO; IPRO02423; -.
PRAM; PEFO0118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONIN60.
PRINTS; PR00304; TCOMPLEXTCP1.
SEQUENCE 548 AA; 57777 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Genome Sequence of the Radioresistant Bacterium radiodurans R1."; Science 286:1571-1577(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INTERPRO; IPR001844; INTERPRO; IPR002423;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TIGR; DR0607;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HSSP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; AE001918; AAF10186.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=1299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Deinococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GROEL PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-OCT-2000 (TrEMBLrel. 15, Last annotation update)
 481
                                                      421
                                                                                  421
                                                                                                              362
                                                                                                                                          361
                                                                                                                                                                      302
                                                                                                                                                                                                  301
                                                                                                                                                                                                                              242
                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                            122
                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                   DTEVDVVEGMQFDKGFINPYFITNPEKMEAVLEDAYILINEKKISNLKDMLPVLEKVAQT
ATGEYVEDMVAAGIVDPAKVTRTALQNAASIGALILTTEAIVSDKPEKA
                       NTLSY-GDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA
                                                      IPAVRKAAESLTGDEATGARILIRALEEPARQIAANAGEEGSVIVNAVVGSDKARYGFNA
                                                                      RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNK-VSELPAGHGLNV
                                                                                                              KLQERLAKLSGGVAVIRVGAATETELKEKKHRYEDALSTARSAVEEGIVAGGGTTLL-RV
                                                                                                                           KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                      DLGHKLENVGMEMLGRAARIRITKDETTIVDGKGEQAQIDARVNAIKGELDSTDSDYARE
                                                                                                                                                                                                 DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                             GRPLLIIAEDVEGEALATLVVNKLRGTLNIAAVKAPGFGDRRKEMLRDIAAVTGGEVVSE
                                                                                                                                                                                                                                                                                                   GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                           AVAVAIEEIKKLAVSVEDSEAIKKVAGISANDETVGQEIASAMDKVGKEGVITTEESKGF
                                                                                                                                                                                                                                                                                                                                                          AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                P45746; 1SRV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Thermus/Deinococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             radiodurans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             52.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EC8829C370F6675D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1402.5;
No. 3.4e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Deinococcales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .5; DB 2;
3.4e-64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Deinococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Deinococcus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            548;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          J.D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                            181
                                                      480
                                                                                                              420
                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                 360
                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                     361
```

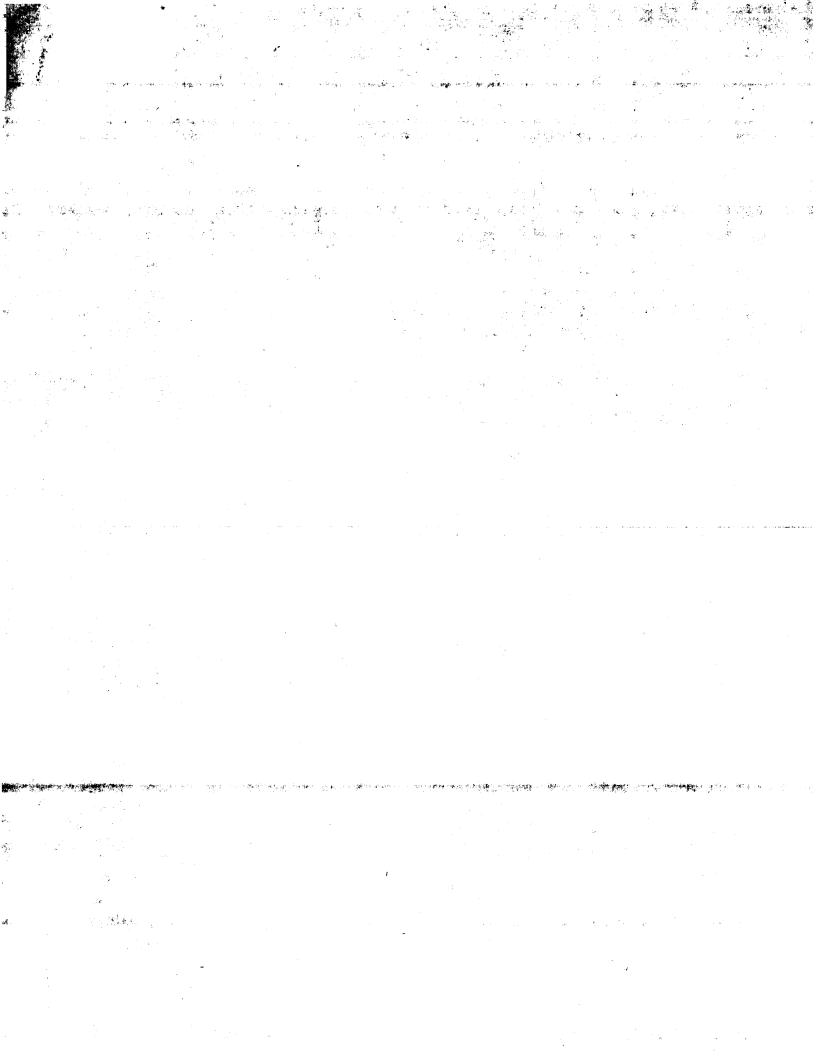
ω

```
O31198
AC O32
AC O32
AC O32
AC O33
AC O32
AC
                     Qy
                                                                                                             δÃ
                                                                                                                                                                  В
                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                               ₽
                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INTERPRO: IPRO01844; -.
INTERPRO: IPRO02423; -.
INTERPRO: IPRO02423; -.
PEAM; PF00118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONIN60.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60; 1.
Heat shock; Chaperone; ATP-binding.
SEQUENCE 546 AA; 57969 MW; 15BC9ECOA8E2A6E3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=HY-1;
Kim M.J., Ahn B.Y.;
Submitted (NOV-1997) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HSP58.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-JAN-1998 (TrEMBLrel. 05, Created)
01-JAN-1998 (TrEMBLrel. 05, Last sequence update)
01-MAY-2000 (TrEMBLrel. 13, Last annotation update)
60 KDA CHAPERONIN (PROTEIN CPN60) (GROEL PROTEIN) (HEAT SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       031198;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Leptospira interrogans.
Bacteria; Spirochaetales;
                                                                           421
                                                                                                                                                                     362
                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                       420
                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
les 275; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG
: | |: | |: ||: ||: || || ||: |||||
                                                                                                                                                                                                                                                                                                                                                                              TGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK
                                                                                                                    ARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNV
                                                                                                                                                                                                            EKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQ
                                                                                                                                                                                                                                                            EDLGMKLENTTLQMLGRANKVTVDKENTTIIEGKGQTKEIQGRIGQIKKQIEDTTSEYDR
                                                                                                                                                                                                                                                                                                          PDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AADAVFEALLASATPVSGKTGIAQVATVS-SRDEQIGDLVGEAMNKVGHDSVVSVKESST
                                                                        AQEAVGSLK - - LDGDEATGAKIIFRALEEPIRMITSNAGLEGSVIVEHAKAKKGNEGFNA
                                                                                                                                                                  EKLQERLAKLAGGVAVIHVGAATEVEMKEKKARVEDALSATRAAVEEGIVPGGGLTLL-K
                                                                                                                                                                                                                                                                                                                                                        AGKPLVIISEEVEGEALATIVVNTLRKTISCVAVKAPGFGDRRKSMLEDIAILTGGQVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                IETTLDVVEGMQFDRGYISPYMVTDAESMVATLNDPFILIYDKKISSMKDLIHILEKVAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AVTAAVESIQKRAVKIENKKDIANVASISANNDNTIGNLIADAMDKVGKDGVITVEEAKS
  --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N.A.
= = = :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Leptospiraceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1384;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
  546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      лв 2;
?.9e-63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Leptospira
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 546;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RINGS
                                                                                                                                                                                        --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                419
                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                          359
                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                       299
                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
```

```
δõ
                                                    밁
                                                                              QΥ
                                                                                                           밁
                                                                                                                                  Qy
                                                                                                                                                                멍
                                                                                                                                                                                         Qy
                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                          뮹
                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
Q9X4R5
                                                                                                                                                                                                                                                                                                                                                                            Query Matcn
Best Local Similarity
Matches 278; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9X4R5 PRELIMINARY;
Q9X4R5;
01-NOV-1999 (TrEMBLrel. 12, 0)
01-NOV-1999 (TrEMBLrel. 12, 1)
01-OCT-2000 (TrEMBLrel. 15, 1)
60 KDA CHAPERONIN (PROTEIN C)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -!- SUBUNIT: OLÎGOMER OF 14 SÜBUNITS COMPOSED
-!- SIMILARITY: BELONGS TO THE CHAPERONIN (HSF
EMBL; AF117741; AAD23455.1; -.
HSSP; P06139; 1JON.
INTERPRO; IPR001844; -.
INTERPRO; IPR002423; -.
PFAM; PF00118; CDP60 TCP1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PFINTS; PRO0304; CHAPERONINGO.
PRINTS; PRO0304; CHAPERONINGO.
PRINTS; PRO0304; CHAPEROTEXTCP1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Kim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Streptococcus pneumoniae Bacteria; Firmicutes; Ba
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Chaperone; ATP-binding. SEQUENCE 540 AA; 57213 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GROEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-CP1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=1313;
362
                           361
                                                      302
                                                                                                           242
                                                                                                                                     241
                                                                                                                                                                 182
                                                                                                                                                                                                                       122
                                                                                                                                                                                           181
                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                 N
                                                                                                                                                                                                                                                                                                                                                            \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S.N., Lee J.Y., Kim S.W., Choi I.H., Rhee D.K.; oSEL sequences in Streptococcus pneumoniae."; mitted (JAN-1999) to the EMBL/GenBank/DDD/ databases. FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER CONDITIONS (BY SIMILARITY).
                                                                                                         SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
KLQERLAKLSGGVAVIKVGAATETELKEMKLRIEDALNATRAAVEEGIVAGGGTAL--
            KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                      DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                 ETELEVVEGMQFDRGYLSQYMVTDSEKMVADLENPYILITDKKISNIQEILPLLESILQS
                                                                                                                                                                                        GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                   AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                SKEIKFSSDARSAMVRGVDILADTVKVTLGPKDRNVVLEKSFGSPLITNDGVTIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LTMVWEDMIQAGVVDPAKVVRSALQNAASIGSMILTTEVTITDKPDK 525
                                                      DLGLELKDATIEALGQAARVTVDKDSTVIVEGAGNPEAISHRVAVIKSQIETTTSEFDRE
                                                                                                                                                                                                                      AVAAAVEALKNNAIPVANKEAISQVAAVSSRSEKVGEYISEAMEKVGKDGVITIEESRGM
                                                                                                                                                                                                                                                                                                   EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                           EDHFENMGAKLVSEIASKTNDIAGDGTTTATVLTQAIVREGIKNVTAGANPIGIRRGIET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (TrEMBLrel. 12,
(TrEMBLrel. 12,
(TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N.A.
                                                                                                                                                                                                                                                                                                                                                                                                51.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacillus/Clostridium group;
                                                                                                                                                                                                                                                                                                                                                                                      98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         , Last sequence update)
, Last annotation update)
CPN60) (GROEL PROTEIN) (HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                                                                                                                                                                                                                                                                                  Score 1374.5; DB 2; Pred. No. 8.8e-63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        4CDB489AF1C632DA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (HSP60)
                                                                                                                                                                                                                                                                                                                                                                                      145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OF TWO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Streptococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SHOCK PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                     ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RINGS
                                                                                                                                                                                                                                                                                                                                                                                     Gaps
 418
                                                                                 360
                                                                                                                                     300
                                                                                                                                                                 241
                                                                                                                                                                                         240
                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                           60
                                                    361
                                                                                                            301
                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QF
                                                                                                                                                                                                                                                                                                                                                                                     ۲,
```

```
δÃ
                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCOMPAGE OF THE PROPERTY OF T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
032847
         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 281; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-102S (PLASMID-FREE DERIVATIVE OF ATCC393);
Murphy C.M., Chassy B.M.;
Submitted (JUN-1997) to the EMBL/GenBank/DDBJ databases.
EMBL; AF01028L; AAB66326.1; -.
HSSP; P06139; 1GRL.
INTERPRO; IPR001844; -.
INTERPRO; IPR002423; -.
INTERPRO; IPR002423; -.
INTERPRO; IPR00243; -.
INTERPRO; IPR00343; -.
INTERPRO; IPR00343;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-JAN-1998
01-JAN-1998
01-JUN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                032847
032847;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lactobacillus.
NCBI_TaxID=57037;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Firmicutes; Bacillus/Clostridium group; Lactobacillaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GROEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GROEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Lactobacillus zeae
         422
                                                                                           419
                                                                                                                                                                                   362
                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      481 TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                15
                                         DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DTELSVVEGMQFDRGYLSQYMVTDNDKMEADLDDPYILITDKKISNIQDILPLLQEIVQQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60: | |:: | | | | | | | |:| |:| |: | | | | | |:| |:| |: | |:| | | | |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |:| |
PAVAALKE-----EGDVQTGINIVLRALEEPVRQIAENAGKEGSVIVEQLKKEKQGVGYN
                                                                                                                                                                                                                                                                                                                                                        DLGLDLKDTKLEQLGRAGKVTVTKDNTTIVDGAGSKDAIAERVNIIKKQIDDTTSDFDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RKALTELRASLIGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGEWVNMIDQGIIDPVKVSRSALQNAASVASLILTTEAVVANKP 522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NVIPAEATLELTGDEATGRNIVLRALEEPVRQIAHNAGFEGSIVIDRLKNAELGIGFNAA 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3 (TrEMBLrel.
5 (TrEMBLrel.
7 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       51.7%; Score 1372.5; DB 2; 53.4%; Pred. No. 1.1e-62;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          05,
05,
14,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                544;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                       478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                 418
                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2,
```

Search completed: January 5, 2001, 14:30:29 Job time: 321 sec



```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OM protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fotal number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         on:
   score q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
DB
1385
1384.5
1359
1359
1344
1344
1339.5
1337
1337
1337
1335
1332.5
1322.5
1322.5
                                                                                                                                                                                                                       1454.5
1440
1426.5
1415.5
1401
1399
1398.5
1393
1393
1393.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    table:
                                                                                                                                                                                                                                                                                                                                                                       2223
1643.5
1620.5
1574.5
1543.5
1543.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                No. is the number of results predicted by chance to a greater than or equal to the score of the result being some derived by analysis of the total score distribution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protein search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 length:
length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               hits
 Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Minimum Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SwissProt_39:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-461-774-2
2654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         January
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SKLIEYDETARRAMEVGMDK....
                                                                                                                                                                                                                                                                                                                                                                                                                                   ....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
20000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      n Match 0%
n Match 100%
y first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5, 2001, 14:25:29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           32294092 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapext
                                                       CH60_CLOTM
CH60_THEBR
CH60_THETM
CH60_EACST
CH60_CLOAB
CH60_CLOAB
CH60_BACSU
CH61_SYNV3
CH61_SYNV3
CH61_BACH0
CH60_BACH0
CH60_BACH0
CH60_BACH0
CH60_SYNP7
CH61_RHOSH
CH60_STAEP
CH60_RHOSH
CH60_RHOSH
CH61_RHOSH
             CH60_LACLA
CH60_RHILV
CH60_BORPE
                                                                                                                                                                                                                                                                                                                                                        CH60_MYCPA
CH62_MYCLE
CH60_CLOTM
                                                                                                                                                                                                                                                                                                                                                                                                   CH61_MYCTU
CH61_MYCLE
CH61_STRAL
CH61_STRCO
CH62_MYCTU
CH62_STRAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ....VVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Search time 35.06 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (without alignments)
495.557 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ġ
P37573
P0597573
P040171
P040171
P040176
P092384
P092319
P045212
P0457246
P0457246
P0457246
P0503072
P0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             to have a being printed,
                                                       8 staphylococ
8 rhodobacter
1 coxiella bu
9 bradyrhizob
9 rhizobium m
                                                                                                                                synechococc
rhodobacter
                                                                                                                                                                                                                                                  clostridium
clostridium
bacillus su
synechocyst
                                                                                                                                                                                                                                                                                                                                          mycobacteri
clostridium
thermoanaer
                                                                                                                                                                                                        bacillus ps
leptospira
                                                                                                                                                                                                                                                                                                                                                                                                                                                 streptomyce
               rhizobium .
bordetella
                                           rhizobium m
                                                                                                                                                                            synechocyst
                                                                                                                                                                                            bacillus ha
                                                                                                                                                                                                                                       synechococc
                                                                                                                                                                                                                                                                                                              thermus aqu
bacillus st
                                                                                                                                                                                                                                                                                                                                                                                     mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                      streptomyce
                                                                                                                                                                                                                                                                                                                                                                                                                    mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                   streptomyce
                                                                                                                                                                                                                                                                                                                                                                                                                                                             mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              mycobacter:
```

######################################	CRES	
PINUS EN ' COO O CO COO COO COO COO COO COO COO	1 HY 1 AC 055 055 055 055 055 055 055 055 055 05	33 33 33 33 33 33 34 44 34 34 34 35 44 36 36 36 36 36 36 36 36 36 36 36 36 36
SEQUENCE FROM N.A. SEQUENCE FROM N.A. STRAIN=ERDMANN; MEDLINE=93219332; PubMed-7681982; KONG T.H., COates A.R.M., Butcher P.D. "Mycobacterium tuberculosis expresses proc. Natl. Acad. Sci. U.S.A. 90:2608 PROPER ASSEMBLY OF UNFOLDED POLYP CONDITIONS (BY SIMILARITY).	161_MYCTU 9573; 059 -NOV-1997 -NOV-1	1318.5 1318.5 1318.5 1317.5 1316.5 1314.5 1314.5 1314.5 1313.5 1313.5 1313.5
OOM N.A. 19332; PubMed=' Coates A.R.M., 'lum tuberculos Acad. Sci. U.; Acad. Sci. U.; N: PREVENTS MI: ASSEMBLY OF UNI ONS (BY SIMILA) '! OLIGOMER OF: ITTS (BY SIMILA) '! OLIGOMER OF: ITTS (BY SIMILA) '! OF UNI ONS (BY SIMILA) '! OF UNI ONS (BY SIMILA) '! ON IN	STANI (Rel. 35 (Rel. 35 (Rel. 36 (Rel. 36 (Rel. 37 (Rel.	44444449999999999999999999999999999999
TSP1	DARD; Cre Las Las (RYA) Las (RYA) Las (RYA) (RYA)	55555555555555555555555555555555555555
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	sate st s st s st s st s st s sit s s s s s s s s s s s s s s s s s s s	1 4 4 4 4 4 4 A 4 4 4 4 4 4 4 4 4 4 4 4
SEQUENCE FROM N.A. SEQUENCE FROM N.A. SETRAIN=BEDMANN; MEDLINE=9221932; PubMed=7681982; MEDGINE=9221932; PubMed=7681982; MINCOBACTERIUM TUBERCULOSIS EXPRESSES TWO PROPER AND THE COADES TO THE CHAPERONIN PROPER ASSEMBLY OF UNFOLDED POLYPEPTID CONDITIONS (BY SIMILARITY).	PRT; 5: d) d) equence up nnotation CPN60-1) OR MTCY78 bacteria; rineae; My 4230; ll J., Gari al. J., Gari A., Cali ll T., Gen A., Rali n S., Squa. mycobacter Mycobacter	CH60_NEIMA CH60_CHRVI CH60_STAAU CH60_NEIMB CH60_AQUAE CH60_BARTU CH60_BARBA CH60_BARBA CH60_BURCE CH60_ENTAE CH60_ENTAE CH60_ENTAE CH60_RIME ALIGNMENTS
: ≰_일○ <u>.世</u> +월 ○ 원콩 ₽:	CH61_MYCTU CH61_MYCTU STANDARD; PRT; 539 AA. CH61_MYCTU ID CH61_MYCTU CH61_MYCTU ID CH61_MYCTU CH61_MYCTU ID CH61_MYCTU ID CH61_MYCTU ID CH61_MYCTU ID CH61_MYCTU ID CH61_MYCTU O1.NOV-1997 (Rel. 35, Created) DT 01.NOV-1997 (Rel. 35, Last sequence update) DT 01.NOV-1997 (Rel. 35, Last sequence update) DT 01.NOV-1997 (Rel. 39, Last annotation update) DT 01.NOV-1997 (Rel. 39, Last annotation update) DT 01.NOV-1997 (Rel. 39, Last annotation update) DT 01.NOV-1997 (Rel. 35, Last sequence update) DT 01.NOV-1997 (Rel. 35, Last sequence "; RC STRAIN=2000 (Rel. 39, Last annotation update) DT 01.NOV-1997 (Rel. 35, Last sequence "; RC STRAIN=197RV; RX MEDLINE=98295987; PubMed=9634230; RR Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., RR Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., RR Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., RR Gordon S.V., Eiglmeier K., Gas S., Barriy C.E. III, Tekala I RA Badocck K., Basham D., Brown D., Chillingworth T., Connor I RR Badocck K., Dasham D., Brown D., Chillingworth T., Connor I RR Badocck K., Sabana D., Brown D., Chillingworth T., Connor I RA Badocck K., Sabana D., Brown D., Studie S., Murpl RA Oliver S., Osborne J., Quail M.A., Rojears R., Sarres R., Sarres R., Whitehead S., Barrell B.G.; RT Toomplete genome sequence."; RL Nature 393:537-544(1998).	
REFOLDING A TED UNDER S TO STACKED R THOUGH A C T	Mycobac Myc	P57006 P31293 Q08854 P423854 O67943 P30779 P367520 P363530 O9zfe0 O66198 P35470
mologs."; NG AND ER STRESS ED RINGS OF a collaboration a collaboration rictions on its is in no way d for commercial sib.ch/announce/	1). e; Mycobacterium. er C., Harris D., kaia F., nnor R., nnor R., N., Holroyd S., Murphy L., ogers J., ogers J., s from the	neisseria m chromatium staphylococ neisseria m aquifex aeo agrobacteri erwinia car bartonella burkholderi enterobacte rhizobium m

01-NOV-1997 01-NOV-1997 30-MAY-2000 60 KDA CHAPEI Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris Gordon S.V., Eiglmeier K., Gas S., Barry C.B. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J. Taylor K., Whitehead S., Barrell B.G.; "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence."; MEDLINE=93219332; PubMed=7681982; KRONG T.H., Coates A.R.M., Butcher P.D., Hickman C.J., Shinnick T.N. "Mycobacterium tuberculosis expresses two chaperonin-60 homologs." Proc. Natl. Acad. Sci. U.S. A. 90:2608-2612(1993). -I- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING AND PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER STREE CONDITIONS (BY SIMILARITY). -I- SUBUNITS OLIGOMER OF 14 SUBUNITS COMPOSED OF TWO STACKED RINGS 7 SUBUNITS (BY SIMILARITY). STRAIN=ERDMANN; Nature [2] MEDLINE=98295987; STRAIN=H37RV; SEQUENCE FROM N.A. Actinomycetales; Mycobacterium tuberculosis. Bacteria; Firmicutes; Actin GROEL1 SEQUENCE FROM N.A. Corynebacterineae; PubMed=9634230; R., Parkhill J. Actinobacteria; Actinobacteridae; Mycobacteriaceae; Mycobacterium. Harris AND STRESS . E., D.,

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DR
DR
FT
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Sim
Matches 528;
                                                                                                                               [1]
SEQUENCE FROM N.A.
MEDLINE-92374850; PubMed-1354834;
A- Wit T.F.R., Bekelie S., Osland A., Miko '
hriffhout J., Schoeningh
                                                                                                                                                                                                                                                                                                                             CH61_MYCLE STANDARD; PRT; 537 AA. p37578; 01-OCT-1994 (Rel. 30, Created) 01-OCT-1994 (Rel. 30, Last sequence update) 01-FEB-1996 (Rel. 33, Last annotation update) 60 KDA CHAPERONIN 1 (PROTEIN CPN60 1) (GROEL PROBLET OR GROEL-1 OR GROEL OR B229_C3_248 OR B1620_C3_228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LT 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRINTS; PR00298; CHAPERONIN60.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60; 1.
Chaperone; ATP-binding; Multigene family; Antigen; Cell wall.
VARIANT 467 N -> K (IN STRAIN ERDMANN).
SEQUENCE 539 AA; 55877 MW; 3E0B93164C091B63 CRC64;
SEQUENCE FROM Smith D.R., R
                                                                                                                                                                                                                                                                     Actinomycetales;
                                                                                                                                                                                                                                                                                          Bacteria; Firmicutes;
                                                                                                                                                                                                                                                                                                               Mycobacterium leprae.
                                                                                     "Mycobacteria contain two groEL genes:
leprae groEL gene is arranged in an op
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Microbiol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGQVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTELEFTEGIGFDKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AADAVSEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMSKVGHDGVVSVEESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                              gene is arranged in a
ol. 6:1995-2007(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                     Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 98.0%;
98.1%;
                                                                                                                                                                                                                                                                 Actinobacteria; Actinobacteridae; nebacterineae; Mycobacteriaceae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2602; Depred. No. 1.4e
5; Mismatches
                                                                                     an operon
                                                                                                          the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; DB 1;
1.4e-117;
                                                                                                                                                      R. [
                                                                                 with groES
                                                                                                          second Mycobacterium
                                                                                                                                                                                                                                                                                                                                                           PROTEIN
                                                                                                                                                                             Hermans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                           1).
                                                                                                                                                      A.A.M.,
                                                                                                                                                                                                                                                                   Mycobacterium
                                                                                                                                                                           P.W.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
```

```
δÃ
                                                                                         DЬ
                                                                                                                              δÃ
                                                                                                                                                                             밁
                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; Z11665; -; NOT_ANNOTATED_CDS.
EMBL; U00015; AAC43228.1; -.
EMBL; U00020; AAA17312.1; -.
PIR; S25181; S25181.
HSSP; P06139; 1GRL.
INTERPRO; IPR001844; -.
INTERPRO; IPR001844; -.
INTERPRO; IPR002423; -.
PFAM; PF00118; CPAPERONINGO.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSTTE; PS00296; CHAPERONING_CPN60; 1
PROSTTE; PS00296; CHAPERONING_CPN60; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Exthe European Bioinformatics Institute. There are no restructe by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use by non-profit institutions as long as its content use as long as its content use as long as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Submitted (MAR-1994) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER CONDITIONS (BY SIMILARITY).
-i- SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED OF TWO STACKED 7 SUBUNITS (BY SIMILARITY).
-i- SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Chaperone;
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a license agreement (See http://www.isb-sib.ch/announce/
or send an email to license@isb-sib.ch).
481
                                            481
                                                                                         421
                                                                                                                                     421
                                                                                                                                                                                  362
                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                  242
                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                            182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                     TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                             SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cal Similarity 82.3
443; Conservative
  TLGYGDLVADGVVDPVKVTRSAVLNAASVARMMLTTETAVVDKPAKTEEHD-HHGHAH
                                                                                         GAALKQLRTSLTGDEALGIDVFFEALKAPLYWIATNAGLDGAVVVDKVSGLPAGHGLNAS
                                                                                                                RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                              AADAVSEALLAVATPVAGKDAITQVATVSSRDEQIGALVGEGMNKVGTDGVVSVEESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
                                                                                                                                                                                                                                                                           ETGLYLREVGTDVLGSARRVVVSKDDTIIVDGGGSNDAVAKRVNQLRAEIEVSDSEWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKLIEYDETARHAMEVGMNKLADTVRVTLGPRGRHVVLAKAFGGPTITNDGVTVAREIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EDPFENLGAQLVKSVATKTNDVAGDGTTTATVLAQALVKGGLRMVAAGANPVALGAGISK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Antigen;
537 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Multigene
55816 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 83.8%;
82.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 2223; u
Pred. No. 1.5e
48; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        family.
F2355B1BCFAED50F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.5e-99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
  537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      commercia
                                                                                                                                     480
                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                           480
                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ę
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2
```

RESULT

```
HE TO THE PROPERTY OF THE PROP
                                                                                                                                          Qy
                                                                                                                                                                                                                                    Q
                                        Qγ
                                                                                             DЬ
                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                       δõ
     밁
                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Chaperone;
INIT_MET
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              reveals two groEL-like genes and three groEL-like proteins in Streptomyces albus.";

J. Bacteriol. 173:7374-7381(1991).

-I- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER CONDITIONS (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-92041838; runner runner guillelmi G., Mazodier P., Thompson C.J., Davies J.; Guglielmi G., Mazodier P., Thompson C.J., Davies J.; "A survey of the heat shock response in four Streptomyces species "A survey of the heat shock response in four Streptomyces species in a control of the proteins in the strength of the proteins in the species and three groef-like proteins in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PFAM: PF00118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONING0.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIR;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             use by non-profit institutions as long modified and this statement is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a between the Swiss Institute of Bioinformatics and the EMBI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mazodier P., Guglielmi G., Davies J. "Characterization of the groEL-like "Lacteriol. 173:7382-7386(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CH61_STRAL STANDARD; PRT; 539 AA.

Q00767;

Q1-APR-1993 (Rel. 25, Created)

01-JUN-1994 (Rel. 29, Last sequence update)

01-FEB-1996 (Rel. 33, Last annotation update)

60 KDA CHAPERONIN 1 (PROTEIN CPN60 1) (GROEL PROTEIN 1) (HSP58).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERPRO; IPR002423; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 1-17 AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Streptomyces albus G. Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=92041639;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Actinomycetales; Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2
  181
                                                                                                  121
                                               181
                                                                                                                                               121
                                                                                                                                                                                                 61
                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                              Ц
                                                                                                                                                                                                                                                                                                                                         Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IL; M76657; AAA26753.1; --
R; B41325; B41325.
R; P06139; IGRL.
RERPRO; IPR001844; --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ween the Swiss Institute of Bioinformatics and the I
European Bioinformatics Institute. There are no resi
by non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7 SUBUNITS (BY SIMILARITY).
SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUBUNIT:
                                                                                                                                                                                                                                                                                                                  GVDLDFTEGMAFDKGYLSPYMVTDQERMEAVLDDPYILIHQGKIGSIQDLLPLLEKVIQA
                         GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKV--A
                                                                                          AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                            AKILKFDEDARRALERGVNQLADTVKVTIGPKGRNVVIDKKFGAPTITNDGVTIAREVEC
                                                                                                                                                                                                                                                                                                                                                                                           330;
                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATP-binding; Multigene 0 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    539
                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OLIGOMER OF 14 SUBUNITS COMPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PubMed=1682304;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  56585
                                                                                                                                                                                                                                                                                                                                                                                                               61.9%;
61.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MW,
                                                                                                                                                                                                                                                                                                                                                                                         87;
                                                                                                                                                                                                                                                                                                                                                                                                               Score 1643.5;
Pred. No. 6.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0522927AE65CD30E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ;
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Thompson C.J.;
enes in Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                               5; DB 1;
.3e-72;
                                                                                                                                                                                                                                                                                                                                                                                         119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OF TWO
                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                         539;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          albus.
                                                                                                                                                                                                                                                                                                                                                                                         5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RINGS
                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  in no way
                                             238
                                                                                             180
                                                                                                                                               180
                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OH.
                                                                                                                                                                                                                                                                                                                                                                                         4,
```

```
SO THE RESIDENCE OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         맖
          Chaperone;
INIT_MET
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              P40171;
01-FEB-1995
01-FEB-1995
01-FEB-1996
60 KDA CHAPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Streptomyces coelicolor.

Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Firmicutes; Actinobacteria; Streptomyces; Streptomyces
                                                                                 INTERPRO; IPRO01844; ...
INTERPRO; IPRO02423; -..
PFAM; PF00118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONINGO.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=A3(2) / J1501;
MEDLINE=94299177; PubMed=7913076;
Duchene A.M., Kieser H.M., Hopwoo
"Characterization of two groEL ge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRCO
                                                                                                                                                                                                                                                  PIR; S37566; S37566.
HSSP; P06139; 1GRL.
                                                                                                                                                                                                                                                                                                     EMBL; X75206; CAA53019.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A3(2)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GROEL1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7 SUBUNITS (BY SIMILARITY).
SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONDITIONS (BY SIMILARITY).
SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REPO
PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ή
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           144:97-101(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRCO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGSKPLLITAEDVEGEALSTLVVNKIRGTFNAVAVKAPGFGDRRKAMLGDMATLTGATVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -AVKVLDD-NLGRTGDEATGVAVVRRAAVEPLRWIAENAGLEGYVITTKVAELDKGQGFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REKLOERLAKLAGGVCVIRVGAATEVELKERKHRLEDAISATRAAVEEGIVSGGGSALVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AEEVGLKLDQAGLDVLGTARRVTVTKDDTTIVDGGGNAEDVQGRVAQIKAEIESTDSDWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NPDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -1995 (Rel. 31, Created)
-1995 (Rel. 31, Last sequence up
-1996 (Rel. 33, Last annotation
-1996 (Rel. 33, Protein CPN60 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          538
ATP-binding; Multigene family.

0 BY SIMILARITY.
539 AA; 56845 MW; A30922A4021A69B2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Hopwood D.1 roEL genes i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .
A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         update)
(GROEL 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              , Thompson C.J., Streptomyces coe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PROTEIN 1) (HSP58).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TWO STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFOLDING
ATED UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mazodier
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q.
```

/ Match

al Similarity 325; Conser

Conservative

92;

61.18;

.; DB 1; 1.8e-71;

Length

118;

4

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Ma
Best Loc
Matches
                                                                                                                                                                         P06806; Q48931; Q48920;
01-JAN-1988 (Rel. 06, Created)
01-GT-1996 (Rel. 34, Last sequence update)
01-OCT-1996 (Rel. 34, Last annotation update)
01-OCT-2000 (Rel. 40, Last annotation update)
60 KDA CHAPERONIN 2 (PROTEIN CPN60-2) (GROEL PROTEIN 2)
ANTIGEN) (HEAT SHOCK PROTEIN 65) (CELL WALL PROTEIN A)
GROEL2 OR GROEL-2 OR HSP65 OR RV0440 OR MTV037.04.
Mycobacterium tuberculosis, and Mycobacterium bovis.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
  Cole S.
           SPECIES-M.TUBERCULOSIS; STRAIN-H37RV;
MEDLINE-98295987; PubMed-9634230;
Cole S.T., Brosch R., Parkhill J., Ga
                                                                                                             SPECIES-M. TUBERCULOSIS; MEDLINE-87137260; PubMed
                                                    SEQUENCE FROM N.A.
                                                                                                    Shinnick
                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                           СН62_МҮСТО
                                                                                                                                                                   Actinomycetales;
                                                                                                                                                                                                                                                                                                                                                                                 537
                                                                                                                                                                                                                                                                                                                                                                                                          478
                                                                                                                                                                                                                                                                                                                                                                                                                                   479
                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                           Bacteriol.
                                                                         65-kilodalton antigen of Mycobacterium acteriol. 169:1080-1088(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HS :-
                                                                                                                                                                                                                                                                                                                                                                                AH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                          AATGEYGDLVKAGVIDPVKVTRSALENAASIASLLLTTETLVVEKKEEEEPAAGGHSHGH
                                                                                                                                                                                                                                                                                                                                                                                                                                 VNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAED--HDHHHGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                          AVK--VLEGNLGKTGDEATGVAVVRRAAVEPLRWIAENAGLEGYVITSKVADLDKGQGFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NPDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDPFEDLGAQLVKSVATKINDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REKLQERLAKLAGGVCVIKVGAATEVELKERKHRLEDAISATRAAVEEGIVSGGGSALVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AVAAVSEDLLATARPIDEKSDIAAVAALSAQDQQVGELIAEAMDKVGKDGVITVEESNTF 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EDPYENLGAQLVKEVATKTNDIAGDGTTTATVLAQALVREGLKNVAAGASPALLKKGIDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AKILKFDEDARRALERGVNKLADTVKVTIGPKA-NVVIDKKFGAPTITNDGVTIAREVEV 59
  S.V.,
                                                                                                   T.M.;
Eiglmeier K.,
                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                 Corynebacterineae; Mycobacteriaceae;
                                                                                                                LOSIS; STRAIN-ERDMANN, PubMed=3029018;
 chill J.,
Gas S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 1620.5;
Pred. No. 7.8e
92; Mismatches
                                                                                                                                                                                                                                                                                            PRT;
 Garnier T.,
Barry C.E.
                                                                                                                                                                                                                                                                                            539
                                                                                                                                                                                                                                                                                            B
                                                                                      tuberculosis.";
                                                                                                                                                                                                                PROTEIN 2) (65 KDA PROTEIN A) (ANTIGEN
             Churcher
  rcher C.
Tekaia
                                                                                                                                                                 Mycobacterium
  щ,
              Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                  ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      238
                                                                                                                                                                                                                                                                                                                                                                                                          537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              239
              D
```

EMBL; EMBL; EMBL; EMBL; EMBL; EMBL;

MBL; AL021932; CAA17397 1; -.

MBL; M17705; AAA25358.1; -.

MBL; U55833; AAC44451.1; -.

MBL; U75825; AAC44458.1; -.

MBL; U17925; AAB39044.1; -.

MBL; U17957; AAB39076.1; -.

MBL; U17957; AAB39076.1; -.

MBL; S76635; -; NOT_ANNOTATED_CR; A26950; A26950.

NOT_ANNOTATED_CDS

EMBL; or send use by modified

s requires a license agreement (See an email to license@isb-sib.ch).

http://www.isb-sib.ch/announce/

Usage

bу

and

for

commercial

non-profit institutions as long and this statement is not removed

```
Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J Taylor K., Whitehead S., Barrell B.G.; "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence."; Nature 393:537-544(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=95150784; PubMed=7848059;
Kapur V., Li L.L., Hamrick M.R., Plikaytis B.B., Shinnick Telenti A., Jacobs W.R. Jr., Banerjee A., Cole S., Yuen K. Clarridge J.E., Kreiswirth B.N., Musser J.M.;
Rapid Mycobacterium species assignment and unambiguous identification of mutations associated with antimicrobial in Mycobacterium tuberculosis by automated DNA sequencing. Arch. Pathol. Lab. Med. 119:131-138(1995).
                                  the
                                                             between
                                                                                                                                                                                                                                                                                                                                                                                                                                               "Detection and identification of mycobacteria Rinsho Byori 43:155-161(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SPECIES=M.TUBERCULOSIS; MEDLINE=95214306; PubMe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SPECIES=M.BOVIS, AND M.TUBERCULOSIS;
ROS C., Belak K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              64-kilodalton protein of Mycobacterium Escherichia coli K-12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-87193155; PubMed=3553003; Thole J.E.R., Keulen W.J., Kolk A.H.J., Tiesjema R.H., van Embden J.D.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Katsuyama T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE OF 64-177 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SPECIES=M.BOVIS,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 63-182 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 45-195 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Characterization, sequence determination,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SPECIES-M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Intect.
                                                                                                                             MYCOBACTERIUM TUBERCULOSIS.

MISCELLANEOUS; THIS PROTEIN IS ONE OF THE MAJOR IMMUNOREACTIVE PROTEINS OF THE WYCOBACTERIA. THIS ANTIGEN CONTAINS EPITOPES THE COMMON TO VARIOUS SPECIES OF MYCOBACTERIA.

SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
SWISS-PROT entry is copyright. It is produced through a collaboration veen the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                               DISEASE: PURIFIED 65 KDA ANTIGEN CAN ELICIT A STROHYPERSENSITIVITY REACTION IN EXPERIMENTAL ANIMALS
                                                                                                                                                                                                                                                                                                                  SUBUNIT: OLIGOMER OF 14 SUBUNITS 7 SUBUNITS (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                  FUNCTION: PREVENTS MISFOLDING AND PROMOTE PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES CONDITIONS (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Immun.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (MAY-1996) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .BOVIS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ueno I.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      55:1466-1475(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AND M. TUBERCULOSIS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-BCG;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PubMed=7699930;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Furuwatari C.,
                                                                                                                                                                                                                                                                                                                                            COMPOSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=TMC410, AND TMC1024;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=356, AND 12-14001;
                                                                                                                                                                                                                                                                                                                                                                                            PROMOTES THE REFO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Groothuis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    unambiguous
antimicrobial resistance
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BCG
                                                                                                                                                                                                                                                                                                                                            OF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       by PCR-RFLP method.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                immunogenicity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Furihata
                                                                                                                                                                                                                                                                                                                                            OMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      expressed
                                                                                                                                                                                                                                                                  STRONG DELAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D.G.,
                                                                                                                                                                                                                                                                                                                                                                                                                          REFOLDING
                                                                                                                                                                                                                                                                                                                                            STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CK T.M.,
                                                                                                                                                                                                                                                                                                                                                                                               UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Berwald
                                                                                                                                                                                                                                                                  DELAYED-TYPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'n
                                                                                                                                                                                                                                                                                                                                                                                                                          AND
                                                                                                                                                                                                                                                                                                                                            RINGS
                                                                                                                                                                                                                                                                                                                                                                                               STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           s:
                                                                                                                                                                                                                                                                                                                                               Q.
```

```
CH62_ST
ID CC62_ST
ID CC62_ST
ID CC62_ST
ID CC66
ID CC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   фb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TUBERCULIST; RV0440; ...

INTERPRO; IPR001844; ...
INTERPRO; IPR002423; ...
PFAM; PF00118; CDN6_TCP1; 1.
PRINTS; PR00299; CHAPERONIN60.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60; 1.
Chaperone; ATP-binding; Multigene family; Ant INIT_MET

INIT_MET
SEQUENCE 539 AA; 56595 MW; FF03460BAA2BC5
SEQUENCE FROM N.A.
MEDIINE-92041639; PubMed-1682304;
MEDGINE-92041639; PubMed J. Davies J.
Mazodier P., Guglielmi G., Davies J.
"Characterization of the groEL-like
J. Bacteriol. 173:7382-7386(1991).
                                                                                                                                                                                                                               CH62_STRAL STANDARD; PRT; 539 AA 000768; 01-APR-1993 (Rel. 25, Created) 01-JUN-1994 (Rel. 29, Last sequence update) 01-FEB-1996 (Rel. 33, Last annotation update 60 KDA CHAPERONIN 2 (PROTEIN CPN60 2) (GROE
                                                                                                                                                                Streptomyces albus G. Bacteria; Firmicutes;
                                                                                                                                                                                                                                                                                                                                                                                STRAL
                                                                                                                                            Actinomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Sinhes 322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    μ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APTLDELK--LEGDEATGANIVKVALEAPLKQIAFNSGLEPGVVAEKVRNLPAGHGLNAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GLQLELTEGMRFDKGYISGYFVTDPERQEAVLEDPYILLVSSKVSTVKDLLPLLEKVIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVGLTLENADLSLLGKARKVVVTKDETTIVEGAGDTDAIAGRVAQIRQEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKPLLTIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AVEKVTETLLKGAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A43509;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P06139;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A43509.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1GRL
                                                                                                                                          Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     59
61
                                                                                                                                          Actinobacteria; Actinobacterid ptomycineae; Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 1574.5;
Pred. No. 1.2e
75; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FF03460BAA2BC557
                                                <u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        family; Antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1574.5; DB
No. 1.2e-68;
                             genes
                                                                                                                           Actinobacteridae;
Actinobacteridae;
Streptomyces
                   Thompson C.J.;
enes in Streptomyces
                                                                                                                                                                                                                                      update)
(GROEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                126;
                                                                                                                                                                                                                                      PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        526
                                                                                                                                                                                                                                      2)
                                                                                                                                                                                                                                      (HSP56).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                wall
                             albus.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
```

```
ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                           Qy
                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOLD DESCRIPTION OF THE PROPERTY OF THE PROPER
                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Sin
Matches 314;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INTERPRO; IPRO01844; -.

INTERPRO; IPRO0242; -.

PFAM; PF00118; cpn60_TCP1; 1.

PRINTS; PR00298; CHAPERONING.

PRINTS; PR00304; TCOMPLEXTCP1.

PROSITE; PS00296; CHAPERONINS_CPN60; 1.

Chaperone; ATP-binding; Multigene famil

INIT_MET

SEQUENCE 539 AA; 56586 MW; B068E77E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a clear the swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and fcentities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=92041638; rupmed records C.J., Davies J.; Guglielmi G., Mazodier P., Thompson C.J., Davies J.; "A survey of the heat shock response in four Streptomyces of the heat s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 [2]
SEQUENCE OF 1-10.
MEDLINE=92041638; PubMed=1682303;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HSSP; P06139; 1GRL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PIR; C41325;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; M76658; AAA26754.1;
                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                           361
                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                           GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLELELTEGMREDKGYISAYFATDMERMEASLDDPYILIVNSKIGNVKDLLPLLEKVMQS
RKALTELRASITGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C41325.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    58.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1543.5;
Pred. No. 3.66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B068E77BEA8F8121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5; DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              131;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              is
is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           υ
•
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 commercial
                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                     30C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2;
```

밁

420

SSVFEKL--ELEGDEATGAAAVKLALEAPLKQIAVNGGLEGGVVVEKVRNLSVGHGLNAA

g S

481

TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA

TGQYVDMIAEGILDPAKVTRSALQNAASIAALFLTTEAVIADKPEKA

```
RESULT
CH60_M
Š
                                            Query Match 58.3
Best Local Similarity 60.0
Matches 316; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CH60_MYCPA
P42384;
01-NOV-1995
01-OCT-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _MYCPA
                                                                                                                                                           VARIANT
VARIANT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                           Chaperone;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-9615/365; PubMed-8574825;
E1-Zaatari F.A.K., Naser S.A., Engstrand L., Burch P.E.,
Hachem C.Y., Whipple D.L., Graham D.Y.;
"Nucleotide sequence analysis and seroreactivities of the
shock protein from Mycobacterium paratuberculosis.";
Clin. Diagn. Lab. Immunol. 2:657-664(195).
-1- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDI
PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UND
CONDITIONS (BY SIMILARITY).
-1- SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED OF TWO STACK.
7 SUBUNITS (BY SIMILARITY).
                                                                                                                                                                                                                               VARIANT
VARIANT
VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; X74518; CAA52630.1;
EMBL; U15989; AAA99670.1;
HSSP; P06139; IGRL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entropean Bioinformatics Institute. There are no restructed by non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    or send
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (HEAT SHOCK PROTEIN 65).
MOPA OR GROEL OR HSP65.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         INTERPRO; IPR002423; -. PFAM; PF00118; cpn60_TCP1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INTERPRO; IPR001844; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -!- SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bujdoso
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30-MAY-2000 (Rel. 39, Last annotation update)
60 KDA CHAPERONIN (PROTEIN CPN60) (GROEL PROTEIN) (65 KDA ANTIGEN)
                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                          VARIANT
                                                                                                                                                                                                                                                                                                                                                                                            PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                 PRINTS;
                                                                                                                                                                                                                                                                                                                                                                                                                                         PRINTS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Actinomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mycobacterium paratuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bmitted (AUG-1993)
  H
    SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                                                                                                                                                                                                                     PR00298; CHAPERONIN60.
PR00304; TCOMPLEXTCP1;
PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  s requires a license agreement (S
an email to license@isb-sib.ch).
                                                                                                                                          ; ATP-binding.

0 0 4

4 4

4 4 428

4 428

4 480

4 90

4 90

4 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 90

5 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             34, Last
39, Last
                                                                 58.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the
                                                                                                                                            BY SIMILARITY.

A -> S (IN STRAIN LINDA).

P -> L (IN STRAIN LINDA).

E -> K (IN STRAIN LINDA).

AD -> TE (IN STRAIN LINDA).

A -> S (IN STRAIN LINDA).

A -> F (IN STRAIN LINDA).

A -> P (IN STRAIN LINDA).

A -> P (IN STRAIN LINDA).

A -> P (IN STRAIN LINDA).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALT_INIT.
                                                                                                                                                               ¥.
                                                 78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sequence update) annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL/GenBank/DDBJ
                                            Score 1543.5; DB 1
Pred. No. 3.6e-67;
B; Mismatches 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROMOTES THE REFOLDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERATED UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TWO STACKED
                                                 Indels
                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ЬY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL
                                                                                           540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    65K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a collaboration

MBL outstation -
                                              Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    heat
                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 commercia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ę
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      way
                                              2;
```

```
CCCCCCCCCCRRRRRRRRRCCOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 8
CH62_MYCLE
                                                                                                                                                                                                                                                                                                                                                                                            01-MAR-1989 (Rel. 1
01-OCT-1996 (Rel. 3
30-MAY-2000 (Rel. 3
60 KDA CHAPERONIN 2
              -
                                                                                       CONDITIONS (BY SIMILARITY).
-i- SUBUNIT: OLIGOMER OF 14 SUBUNITS
7 SUBUNITS (BY SIMILARITY).
-i- DISEASE: PURIFIED 65 KDA ANTIGEN
                                                                                                                                                                        Rajandream M.A.;
Submitted (JAN-1
                                                                                                                                                                                                      Brown D.,
                                                                                                                                                                                                                                                                     MEDLINE=86313701; PubMed=2428046; Mehra V., Sweetser D., Young R.A.;
                                                                                                                                                                                                                                                                                                                                     Mycobacterium leprae.
Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                  GROEL - 2
                                                                                                                                                                                                                                                                                                                                                                               ANTIGEN)
                                                                                                                                                                                                                                                                                                                                                                                                                                   P09239;
01-MAR-1989
                                                                                                                                                                                                                                                                                                                                                                                                                                                              CH62_MYCLE
                                                                                                                                                                                                                 SEQUENCE FROM N.
                                                                                                                                                                                                                                            Proc. Natl. Acad.
                                                                                                                                                                                                                                                         "Efficient mapping
                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                           Actinomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ш
                                                                                                                                 FUNCTION: PREVENTS MISFOLDING PROPER ASSEMBLY OF UNFOLDED POCONDITIONS (BY SIMILARITY).
         MISCELLANEOUS: THIS PROTEIN IS ONE OF THE MANO PROTEINS OF THE MYCOBACTERIA. THIS ANTIGEN CON ARE COMMON TO VARIOUS SPECIES OF MYCOBACTERIA. SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60)
                                                               HYPERSENSITIVITY REACTION IN MYCOBACTERIUM TUBERCULOSIS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGEYEDLLKAGIADPVKVTRSALQNAASIAGLFLTTEAVVADKPEKA 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IPALDELKPE--GEEATGANIVRVALERPLKQIAFNGGLEPGVVAEKVRNSPAGTGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKETEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALLH-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEDPFILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A VEKVTETLLK SAKE VETKDQIAATAA ISAGDQSIGDLIAE AMDKVGNEGVIT VEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OR MLCB1450.05C.
                                                                                                                                                                                                                                           , Sweetser D.,
nt mapping of p
tl. Acad. Sci.
                                                                                                                                                                                                     Churcher C.M.,
                                                                                                                                                                           (JAN-1998) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                                          Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                       10, Created)
34, Last sequence update)
39, Last annotation updat
2 (PROTEIN CPN60 2) (GROE
                                                                                                                                                                                                                                            protein antigenic determinants. U.S.A. 83:7013-7017(1986).
                                                                                                                                                               the EMBL/GenBank/DDBJ databases MISFOLDING AND PROMOTES THE REFO
                                                                                                                                                                                                   James K.D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                 POLYPEPTIDES GENERATED UNDER
                                                                              EXPERIMENTAL ANIMALS
                                                                                                                                                                                                                                                                                                                           Mycobacteriaceae;
                                                                                          CAN ELICIT A
                                                                                                                      COMPOSED
                                                                                                                                                                                                   Parkhill J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                               PROMOTES THE REFOLDING
                                                                                                                                                                                                                                                                                                                                        Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                            update)
(GROEL PROTEIN
                                      OF THE MAJOR IMM
ANTIGEN CONTAINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                               A
                                                                                                                      OF.
                                                                                                                      TWO STACKED
                                                                                                                                                                                                   Barrell
                                                                                           STRONG
                                                    IMMUNOREACTIVE
                                                                                                                                                                                                                                                                                                                                                                                            2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           527
                                                                              INFECTED
                                                                                                                                                                                                                                                                                                                           Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                             (65
                                       EPITOPES
                                                                                            DELAYED-TYPE
                                                                                                                                                                                                      в.G.,
                                                                                                                      RINGS
                                                                                                                                                 STRESS
                                                                                HTIW
                                       THAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                       OF
```

```
RESULT
CH60_CI
ID CH
AC P,
DT 00
DT 0
DT 3
DE 6
GN 1
                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            da
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  дg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HSSP: PUBLICATION
INTERPRO; IPR001844; -.

RINTERPRO; IPR002423; -.

REPFAM; PF00118; cpn60_TCP1; 1.

REPFAM; PF00118; cpn60_TCP1; 1.

REPFAM; PF00304; TCOMPLEXTCP1.

REPRINTS; PR00304; TCOMPLEXTCP1.

REPRINTS; PR003043; TCOMPLEXTCP1.

REPRINTS; PR002433; --

REPRINTS; PR00243; --

REPRINTS; PR00243; --

REPRINTS; PR00243; --

REPRINTS; PR002304; TCOMPLEXTCP1.

RE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
OH60_CLOTM STANDARD; PRT; 540 AA P48212; 01-FEB-1996 (Rel. 33, Created) 01-OCT-1996 (Rel. 34, Last sequence update) 30-MAY-2000 (Rel. 39, Last annotation update) 60 KDA CHAPERONIN (PROTEIN CPN60) (GROEL PROPAD OR GROEL.
                                                                                                                                                                          CLOTM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; AL035159; CAA22689.1;
PIR; A25902; A25902.
HSSP; P06139; 1GRL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWI
between
the Euro
use by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                      478
                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TGEYEDLLKAGVADPVKVTRSALQNAASIAGLELTTEAVVADKPEK
                                                                                                                                                                                                                                                                                                                 TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK
                                                                                                                                                                                                                                                                                                                                                                                    RKALTELRASITGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEEPYILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLFLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APALDKLK--LTGDEATGANIVKVALEAPLKQIAFNSGMEPGVVAEKVRNLSVGHGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVGLTLENTDLSLLGKARKVVMTKDETTIVEGAGDTDAIAGRVAQIRTEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                             KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AVDKVTETLLKDAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AKTIAYDEEARRGLERGLNSLADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          M14341; AAA25354.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity 60.1
16; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   58.2%;
60.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ALT_INIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1543.5; DB Pred. No. 3.6e-67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                               update)
                           PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                   526
                                                                                                                                                                                                                                                                    523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ω,,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                             419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2
```

```
Š
                                               В
                                                                                    Qy
                                                                                                                                          밁
                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                 뮹
                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STITION DESCRIPTION DE LA RESERVACION DEL RESERVACION DE LA RESERVACION DEL RESERVACION DE LA RESERVAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Chaperone;
INIT_MET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=NCIB 10682;
MEDLINE=96257758; PubMed=8687408;
Cross S.J., Ciruela A., Poomputsa K., Romaniec M.P.M.,
"Thermostable chaperonin from Clostridium thermocellum
Biochem. J. 316:615-622(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=97199381; PubMed=9047357; Ciruela A., Cross S., Freedman R.B., Hazlewood G.P.; "Sequence and transcriptional analysis of groES and the thermophilic bacterium Clostridium thermocellum. Gene 186:143-147(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PFAM, PF00118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONING.
PRINTS; PR00304; TCOWPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Clostridium thermocellum Bacteria; Firmicutes; Bacclostridium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO; IPRO01844;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 1-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-NCIB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INTERPRO;
  301
                                                                                           241
                                                                                                                                          181
                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FUNCTION: PREVENTS MISFOLDING AND PROMOTES OF PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES OF CONDITIONS (BY SIMILARITY).
SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7 SUBUNITS. SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY
DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                            GKKLVIIAEDVEGEALATLLVNKLRGTFTCVAVKAPGFGDRRKAMLEDIAILTGGQVITS
                                                                     GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                        GTNLEIVEGMQFDRGYVSPYMVTDTEKMEAVLDEPYILITDKKISNIQDILPLLEQIVQQ
                                                                                                                                                                GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                 AKQIKFGEEARRALERGVNQLADTVKVTLGPKGRNVVLDKKFGSPMITNDGVTIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Z68137; CAA92242.1; P06139; IGRL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity 55.5%; Pr
92; Conservative 102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            200296; CHA.
200296; CHA.
200296; CHA.
200296; CHA.
200296; CHA.
2002976; CHA.
2002976; CHA.
2002977343 MV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IPR002423;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10682;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   54.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacillus/Clostridium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                O .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1454.5; DB Pred. No. 6.3e-63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E -> ML (IN REF. 2).
-> K (IN REF. 2).
A638C71A2675C596 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       _{\text{OWT}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Clostridiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFOLDING
ATED UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Freedman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           <u>,,</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 R.B.;
                                                                                                                                                                                                                                                                                  180
                                          300
                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                         300
                                                                                                                                        240
                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1;
```

Ψ

```
Ş
                                                                                                                                                                                                                                                                                                                                                       RESULT 10
CH60_THEBR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CH60_THEBR STANDARD; PRT; 540 AA G60024; 01-NOV-1997 (Rel. 35, Created) 01-NOV-1997 (Rel. 35, Last sequence update) 30-MAY-2000 (Rel. 39, Last annotation update) 60 KDA CHAPERONIN (PROTEIN CPN60) (GROEL PR
                                                                                                                                                                                             use by non-profit institutions as long modified and this statement is not remove entitles requires a license agreement (so or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                            Truscott K.N., Hoej P.B., Scopes R.K.;

"Purification and characterization of chaperonin 60 and chaperonin from the anaerobic thermophile Thermoanaerobacter brockii.";

Bur. J. Biochem. 222:277-284(1994).

-I- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING AND PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER STRESS CONDITIONS (BY SIMILARITY).

-I- SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED OF TWO STACKED RINGS 7 SUBUNITS (BY SIMILARITY).
                                                        PFAM; PF00118; cpn60_TCP1; 1.
PRINTS; PR001298; CHAPERONING0.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entropean Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content
                            Chaperone; ATP-binding.
INIT_MET 0 0
                                                                                                                                                                 EMBL; U56021; AAB00559.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Sequence analysis and heterologous expression of the groE genes from Thermoanaerobacter sp. Rt8.G4.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=RT8.G4;
MEDLINE=99014232; PubMed=9795109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Thermoanaerobacter brockii (Thermoanaerobium brockii). Bacteria; Firmicutes; Bacillus/Clostridium group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOPA OR GROEL.
                                                                                                                     INTERPRO; IPR001844; -.
                                                                                                                                                                                                                                                                                                                      - 1 - SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Thermoanaerobacter
               CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=94291621; PubMed=7912671;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-RT8.G4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 1-43, AND CHARACTERIZATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Truscott K.N.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                      MASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      217:15-23(1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NEKYVNMIEAGIVDPAKVTRSALQNAASVASMVLTTESVVADIPEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PK-VAKVLDTVSGDEKTGVQIILRALEEPVRQIAENAGLEGSVIVEKVKASEPGIGFDAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KLQERLAKLAGGVAVIQVGAATETEMKEKKLRIEDALAATKAAVEEGIVAGGGTALVNVI 420
                                                                                                                                                    P06139; 1GRL.
                                                                                                                                                                                                                                                                                                                                      SPECTROMETRY: MW-57949; MW_ERR-10; METHOD-ELECTROSPRAY
 540
              430
 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Scopes R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          group;
 43
57928
 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Thermoanaerobacter
                                                                                                                                                                                                            is not removed. Usage by agreement (See http://www.
              G
 -> A (IN REF. 2).
27C316AD35C61734 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (GROEL PROTEIN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         526
                                                                                                                                                                                                                             Уď
                                                                                                                                                                                                                                                          restrictions
                                                                                                                                                                                                             isb-sib.
                                                                                                                                                                                                                             and
                                                                                                                                                                                                                                                                         EMBL
                                                                                                                                                                                                                                                                                        a collaboration
                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                         outstation
                                                                                                                                                                                                               ch/announce/
                                                                                                                                                                                                                               commercia:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                             ņ
                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                    QF
                                                                                                                                                                                                                                                                                                                                                                                                                                                              10
                                                                                                                                                                                                                                          way
```

```
RESULT 11
CH60_THEN
ID CH60_T
AC P45746
DT 01-FEB
DT 01-FEB
DT 01-FEB
DT 01-FEB
DT 01-FEB
ON MOPA 0
OS Thermu
OS THERM
RN EXUEN
RN [1]
RP SEQUEN
RX MEDLIN
RA YOShid
RT "MOlec
RT "Molec
RT "Bic
RN [2]
RP SEQUEN
RC STRAIN
RX MEDLIN
RX STRAIN
RX MEDLIN
RX SEQUEN
RX SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CH60_THETH STANDARD; PR
P45746; Q60018;
01-NOV-1995 (Rel. 32, Created)
01-FEB-1996 (Rel. 33, Last seque
30-MAY-2000 (Rel. 39, Last annot
60 KDA CHAPERONIN (PROTEIN CPN60
                                                                                                                  STRAIN=HB8 / ATCC 27634;
Erbeznik M., Joachimiak A.;
"Cloning and characterization of
                                                                                                                                                                                                                                                                                                                                                   STRAIN=HB8 / ATCC 27634;
MEDLINE=96064154; PubMed=8543569;
Amada K., Yohda M., Odaka M., Endo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MOPA OR GROEL OR HSP60.
Thermus aquaticus (subsp. thermophilus)
                        SEQUENCE OF 1-43
                                                                                               aquaticus
                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Thermus/Deinococcus group;
    MEDLINE=92042183; PubMed=1682319;
                                                                         Submitted
                                                                                                                                                                                            SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                   "Molecular cloning, expression,
and chaperonin-10 from a thermop
                                                                                                                                                                                                                                                                                                                                  Yoshida M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1
                                                                                                                                                                                                                                        Biochem.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YDAYKEEFTDMFKAGIVDPTKVTRTALQNAASIASMILTTEAIVVDIPEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HQARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKV-SELPAGHG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ELGYDLKDVRLDMLGRARQVKVTKEYTTIVGGAGDPSEIKKRVNQIKAQIEETTSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE : | | ::|:|::: ||:|||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKKLLIIADDVEGEALATLIVNKLRGTFTCVAVKAPGFGDRRKEMLQDIAILTGGQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AVDAAVEGLKRISKPIDNKESIAHVASISAADEEIGKLIAEAMDKVGKDGVITVEESKTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AKQIKYGEEARRALERGYNAVADTVKYTLGPRGRNVVLDKKYGSPTVTNDGVTIAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTLEVVEGMQFDRGYISPYMVTDAEKMEAVLEEPVILITDKKISNIQDLLPLLEQIVQQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDPFENQGAQLLKEAATKTNDIAGDGTTTATLLAQAMVREGLKNLAAGANPMLLRRGIAK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EDVQKVVD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            292;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                 HB8
                                                                         (JUN-1995)
                                                                                                                                                                                                                                        118:347-354(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -SLEGDFKTGAKIVLRALEEPVRQIATNAGVDGSVIVEKIKAAKDPNFG
                                                                         ូ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       54.3%; Score 1440; I
55.1%; Pred. No. 3.10
tive 95; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Last sequence update)
Last annotation updat
DTEIN CPN60) (GROEL PR
                                                                         the
                                                                                                                                                                                                                                                                                   ession, and characterization of othermophilic bacterium, Thermus
                                                                         EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                       the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tion update)
(GROEL PROTEIN)
                                                                                                                                                                                                                                                                                                                                                     Ι.,
                                                                                                                     GroESL operon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Thermus group; Thermus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3.1e-62;
                                                                                                                                                                                                                                                                                                                                                        Ishii N., Taguchi H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            135;
                                                                         databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                       ä
                                                                                                                                                                                                                                                                                      of chaperonin-60
rmus thermophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
```

```
Query Match
Best Local S
Matches 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Chaperone;
INIT_MET
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          entities requires
or send an emain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PFAM; PF00118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONINGO.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; D45880; BAA08299.1; -. EMBL; U29483; AAA83441.1; -. PIR; A39313; A39313. PDB; 1SRV; 12-MAR-99.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      <del>:</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Submitted (MAR-1999) to the PDB data bank.
-!- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Taguchi H., Konishi J., Ishii N., Yoshida M.;
"A chaperonin from a thermophilic bacterium, Thermus ther
that controls refoldings of several thermophilic enzymes
J. Biol. Chem. 266:22411-22418(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO; IPRO
PFAM; PF00118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Walsh M.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INTERPRO; IPR001844; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             X-RAY CRYSTALLOGRAPHY (1.7 ANGSTROMS)
   361
                                361
                                                               301
                                                                                             301
                                                                                                                             241
                                                                                                                                                                                        181
                                                                                                                                                                                                                                                        121
                                                                                                                                                         241
                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7 SUBUNITS (BY SIMILARITY).
SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SUBUNIT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CONDITIONS
                                                                                                                                                                                                       GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                      AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                           SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                           DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                          GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                             KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                          GKPLLTTAEDVEGEALATLVVNKLRGTLSVAAVKAPGFGDRRKEMLKDTAAVTGGTVTSE
                                                                                                                                                                                        ETELKFVEGYQFDKGYISPYFVTNPETMEAVLEDAFILIVEKKVSNVRELLPILEQVAQT
                                                                                                                                                                                                                                                      AVEAAVEKIKALAIPVEDRKAIEEVATISANDPEVGKLIADAMEKVGKEGIITVEESKSL
                                                                                                                                                                                                                                                                                                                  EDHLENIGAQLLKEVASKTNDVAGDGTTTATVLAQAIVREGLKNVAAGANPLALKRGIEK
                                                                                                                                                                                                                                                                                                                                 EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
KLQERLAKLAGGVAVIRVGAATETELKEKKHRFEDALNATRAAVEEGIVPGGGVTLL-RA
                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity 54.4
89; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2; ATP-binding; 3D-structure.

0 0 0 R -> N (1

238 238 A -> R (1

436 439 TGAK -> F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IPR002423; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        436
542 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dementieva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OLIGOMER OF 14 SUBUNITS COMPOSED
                                                              LSMLGRAERVRITKDETTIVGGKGKKEDIEARINGIKKELETTDSEYARE
                                                                                                                                                                                                                                                                                                                                                                                                                                                          53.7%;
54.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        57758 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                           100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Evans G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1426.5;
Pred. No. 1.4e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R -> N (IN REF. 3).
A -> R (IN REF. 2).
TGAK -> RAPE (IN REF. 2).
; 1A3C991A89F3DE8E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OF 190-334.
Sanishvili R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                       .5; DB 1; Length .4e-61;
                                                                                                                                                                                                                                                                                                                                                                                                                                           137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Thermus thermophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OF TWO
                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFOLDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Joachimiak A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                           Çī
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                  120
                                                              360
                                                                                           360
                                                                                                                          300
                                                                                                                                                         300
                                                                                                                                                                                        240
                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OF.
                                                                                                                                                                                                                                                                                                                                                                                                                                          ω
```

δ Вþ S 밁 νQ

밁

Qy В Q Вb ρy g

В

```
Ş
                                                                            ρy
 B
                                                    В
                                                                                                      B
                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q07201;
01-OCT-1994
01-OCT-1994
30-MAY-2000
                                                                                                                                                                                                                                                   INTERPRO; IPRO01844; ...
INTERPRO; IPRO02423; ...
PFAM; PFO0118; cpn60_TCP1; 1.
PRINTS; PR00298; CHAPERONINGO.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60; 1.
                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a cobetween the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Molecular cloning, sequencing, and transcriptional analysis groest operon from Bacillus stearothermophilus.";
J. Bacteriol. 175:2465-2469(1993).
-i- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacillus stearothermophilus.
Bacteria; Firmicutes; Bacillus/Clostridium group;
Bacillus/Staphylococcus group; Bacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BACST
                                                                                                                                                                                                                              Chaperone;
SEQUENCE
                                                                                                                                                                                                                                                                                                                                   EMBL; L10132; AAA22752.1; HSSP; P06139; 1GRL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONDITIONS (BY SIMILARITY).
-1- SUBUNIT: OLIGOMER OF 14 SUBUNITS
7 SUBUNITS (BY SIMILARITY).
-1- INDUCTION: BY HEAT SHOCK.
                                                                                                                                                                                                                                                                                                                                                                          or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                        entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Schoen U.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=93224474; PubMed=8096841;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-NUB36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOPA OR GROEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CH60_BACST
 122
                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                               61
                                                      62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -OCT-1994 (Rel. 30, Last sequence update)
-MAY-2000 (Rel. 39, Last annotation update)
-KOA CHAPERONIN (PROTEIN CPN60) (GROEL PROTEIN).
                                                                                                         N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY
                                                                                                                      SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                   AVAVAVEELKAISKPIQGKESIAQVAAISAADEEVGQLIAEAMERVGNDGVITLEESKGF
                       AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                        AKEIKFSEEARRAMLRGVDKLADAVKVTLGPKGRNVVLEKKFGSPLITNDGVTIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NVNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKV---SELPAGHGL 477
                                                                                                                                                             283;
                                                                                                                                                                         Similarity
                                                                                                                                                                                                                           ATP-binding; Heat shock.
539 AA; 57244 MW; 37FE4A0D7492CC3E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Schumann W.;
                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (Rel. 30, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                         53.3%;
                                                                                                                                                           98;
                                                                                                                                                           Score 1415.5;
Pred. No. 4.6e
98; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPOSED OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          539
                                                                                                                                                                                                                                                                                                                                                                                       (See http://www.isb-sib.ch/announce/
                                                                                                                                                                         5; DB 1;
.6e-61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                                                                                                                                                             140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OMI
                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                              restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           529
                                                                                                                                                           ω
                                                                                                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                                                                                                                                             collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Oť.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AND
STRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RINGS
                                                                                                                                                                                                                                                                                                                                                                                                                                          outstation
                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                     n no way
                                                                                                        6.1
                                                                                                                                 60
181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                478
                                                                                                                                                                                                                                                                                                                                                                                                                               on.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QF
```

```
RESULT 13
CH60_CLOAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                            Narberhaus F., Bahl H.;
"Cloning, sequencing, and molecular analysis of tolostridium acetobutylicum.";
J. Bacteriol. 174:3282-3289(1992).
-i- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENE CONDITIONS (BY SIMILARITY).
-i- SUBUNIT: OLIGOMER OF 14 SUBUNITS COMPOSED OF
                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
              Chaperone;
                            PRINTS; PR00298; CHAPERONIN60.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60;
                                                                    INTERPRO; IPRO01844; ...
INTERPRO; IPRO02423; ...
PFAM; PF00118; cpn60_TCP1;
                                                                                                                                   EMBL; M74572; AAA23243.1; PIR; B41872; B41872.
                                                                                                                                                                              entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                            modified and this statement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Clostridium acetobutylicum Bacteria; Firmicutes; Baci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-APR-1993
01-APR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CH60
                                                                                                                      HSSP; P06139; 1GRL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A. MEDLINE=92250424; PubMed=1349602;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Clostridium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOPA OR GROEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-APR-1993 (Rel.
01-APR-1993 (Rel.
30-MAY-2000 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P30717;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KDA CHAPERONIN
                                                                                                                                                                                                                                                                                                  7 SUBUNITS (BY SIMILARITY).
SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   _CLOAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TGEWVDMIEAGIVDPTKVTRSALQNAASVAAMFLTTEAVVADKP 522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SKVAA---IEAEGDEATGVKIVLRAIEEPVRQIAQTAGLEGSIIVERLKTEKPGIGFNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GRPLLITAEDVEGEALATLVVNKLRGTFNAVAVKAPGFGDRRKAMLEDIAILTGGEVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLQERLAKLAGGVAVIKVGAATETELKERKLRIEDALNSTRAAVEEGIVAGGGTALMNVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATELDVVEGMQFDRGYVSPYMITDTEKMEAVLENPYILITDKKVSSIQEILPILEQVVQQ
               ATP-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25, Created)
25, Last sequence update)
39, Last annotation updat
(PROTEIN CPN60) (GROEL PF
58073 MW;
                                                                                                                                                                                                                                                                                                                                                                                                               and molecular analysis of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacillus/Clostridium
                                                                                                                                                                                              agreement (See http://www.isb-sib.
                                                                                                                                                                                                               is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
 6FD16C2EBDA03DAC CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (GROEL PROTEIN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   543
                                                                                                                                                                                                                                                                                                                                                             PROMOTES THE REFOLDING PRINCES GENERATED UNDER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              group; Clostridiaceae;
                                                                                                                                                                                                            Usage
                                                                                                                                                                                                                                                                                                                                 TWO STACKED
                                                                                                                                                                                                                                                                                                                                                                                                                       groESL
                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                     operon
                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                             AND
STRESS
                                                                                                                                                                                                                                                                                                                                   RINGS
                                                                                                                                                                                               ch/announce/
                                                                                                                                                                                                               commercia]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        478
                                                                                                                                                                                                                                                                                                                                                                                                                       of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                   OF
F
```

Query Match

52

88

Score 1401;

DB

1;

Length

543;

```
RESULT 14
CH60_CLOPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches 287; Conserv
                                                                                                                                                                                                                                                                                                                                                                                   01-AUG-1992
30-MAY-2000
60 KDA CHAPE
                  entities
or send a
                                             use by modified
                                                                                       This SWI
                                                                                                                            RUSANGAMAR E., Singh B., Gupta R.S.;
Rusanganwa E., Singh B., Gupta R.S.;
"Cloning of HSP60 (GroEL) operon from Clostridium perfringens using
polymerase chain reaction based approach.";
Biochim, Biophys. Acta 1130.90-94(1992).
-i- FUNCTION: PREVENTS MISFOLDING AND PROMOTES THE REFOLDING AND
PROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GENERATED UNDER STRESS
CONDITIONS (BY SIMILARITY).
-i- SUBUNIT: OLICOMER OF 14 SUBUNITS COMPOSED OF TWO STACKED RINGS (
7 SUBUNITS (BY SIMILARITY).
-i- SIMILARITY: BELONGS TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                         Clostridium perfringens.
Bacteria; Firmicutes; Ba
                                                                                                                                                                                                                                                                                                                                                                                                                                             CH60_CLOPE
P26821;
                                                                        the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                            Clostridium
                                                                                                                                                                                                                                                                                                                                                                     MOPA OR GROEL
                                                                                                                                                                                                                                                                                                                                                                                                                             01-AUG-1992
                                                                                                                                                                                                                                                                               MEDLINE=92182020; PubMed=1347462;
                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                              -AUG-1992 (Rel. 23, Last sequence update)
-MAY-2000 (Rel. 39, Last annotation updat
-MAX-2000 (Rel. 39, Last annotation updat
-MAX CASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SWISS-PROT entry is copyright. It is produced through a deen the Swiss Institute of Bioinformatics and the EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --VLPEVR-ELTSDEPDVQVGINIIVKALEEPVRQIAANAGLEGSVIIEKIINSEKGIGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RKALTELRASLTGDE---VLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLQERLAKLAGGVAVVKVGAASETELKERKMRIEDALAATKAAVEEGIIAGGGTAYIN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ELGKDLKDVKVEDLGSAESVKISKENTTIVNGRGDKSAIHDRVAQIRGQIEETTSDFDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTELDVVEGMQFDRGYLSPYMVTDQEKMEAVLDDPYILITDKKIANIQEILPLLEQIVQQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AKQILYGEEARRSMQKGYDKLADTYKYTLGPKGRNVYLDKKFGAPLITNDGYSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NVNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AVDKTVEGLKKVSKNVNGKEDIARVASISAADPEIGKLIADAMEKVGNEGVITVEESKSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EDPYENMGAQLVKEVATKTNDVAGDGTTTATLLAQAIIREGLKNVTAGANPMLIRNGIRL
non-profit institutions as long as its content and this statement is not removed. Usage by an requires a license agreement (See http://www.isb-an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                               (Rel.
(Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                 23, Creat
23, Last
39, Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              54.3%;
                                                                                                                                                                                                                                                                                                                                         Bacillus/Clostridium
                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No. 2.3
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                                                                                                                                                                                                                                   tion update)
(GROEL PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                          539
                              (See http://www.isb-sib.ch/announce,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 2.3e-60;
tches 133;
                                                                                                                                                                                                                                                                                                                                         group;
                                                                                                                                                                                                                                                                                                                                          Clostridiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                          restrictions on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              526
                                               and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8,
                                                                                          collaboration
L outstation -
                                                                                         outstation
                                                              In
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                  90
                                                              no
                                                                                                                                                                                                                                                       ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 w
```

```
RESULT
ICH60_BA
ICH00_BA
ICH00_BA
ICH00_BA
ICH00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CC
DR
DR
DR
DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query
Best 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; X62914; CAA44697.1; -.
PIR; S18869; S18869.
PIR; S22342; S22342.
HSSP; P06139; 1GRL.
INTERPRO; IPR001844; -.
INTERPRO; IPR002423; -.
PFAM; PF00118; CP060_TCP1; 1.
PRINTS; PR00298; CHAPERONIN60.
PRINTS; PR00304; TCOMPLEXTCP1.
PROSITE; PS00296; CHAPERONINS_CPN60; 1.
Chaperone; ATP-binding.
SEQUENCE 539 AA; 57380 MW; D13AA4D4
                                                                                                                                                                                                                                     CH60_BACSU STAN
P28598; O05526;
O1-DEC-1992 (Rel. 2
O1-FEB-1995 (Rel. 3
30-MAY-2000 (Rel. 3
  SEQUENCE FROM N.A.
MEDLINE-92283754; PubMed-1350777;
Schmidt A., Schiesswohl M., Voelk
"Cloning, sequencing, mapping, an
                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                         BACSU
                                                                                                                                              Bacteria; Firmicutes;
                                                                                                                                                                 Bacillus subtilis
                                                                                                                                                                                            MOPA OR GROEL.
                                                                                                                   Bacillus/Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         418
                                                                                                                                                                                                                                                                                                                                                                                                                                                  477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local
                                                                                                                                                                                                               KDA CHAPERONIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 SKLIEYDETARRAMEYGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HQARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGG----ASLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTELDVVEGMQFDRGYVSAYMVTDTEKMEAVLDNPLVLITDKKISNIQDLLPLLEQIVQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLQERLAKLAGGVAVVKVGAATETELKESKLRIEDALAATKAAVEEGIVPGGGTAYVNVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EVGGDLKEATLDMLGEAESVKVTKESTTIVNGRGNSEEIKNRINQIKLQLEATTSEFDKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKKLLIIADDIEGEAMTTLVVNKLRGTFTCVGVKAPGFGDRRKEMLQDIATLTGGVVISD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EDAYENMGAQLVKEVATKTNDVAGDGTTTATLLAQAIIREGLKNVTAGANPILIRNGIKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NEVAKLTSDIQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AKTLLFGEEARRSMQAGVDKLANTVKVTLGPKGRNVILDKKFGSPLITNDGVTIAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             277;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                     24,
31,
39,
                                                                                                                                                                                                          24, Created)
31, Last sequence update)
39, Last annotation update)
(PROTEIN CPN60) (GROEL PROT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 52.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -DEQVGINIIVRSLEEPMRQIAHNAGLEGSVIIEKVKNSDAGVGF
                                                                                                                   Bacillus/Clostridium us group; Bacillus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109;
    Noelker
ng, and t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1399;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            D13AA4D40C8EC580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
  U., Hecker M.,
transcriptional
                                                                                                                                                                                                                                                                                                                                 543
                                                                                                                                                                                                               PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .8e-60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                         group
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                               (STRESS
  Schumann
analysis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                             PROTEIN H5).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2
```

```
entities
or send a
                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collab between the Swiss Institute of Bioinformatics and the EMBL outst the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for come entities requires a license agreement (See http://www.isb-sib.ch/an
                                     EMBL;
EMBL;
                                                                                                                                                                                                                                                            in Bacillus subtilis.";
J. Gen. Microbiol. 138:2125-2135(1992)
-!- FUNCTION: PREVENTS MISFOLDING AND PROPERTY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=168 / MARBURG:
MEDLINE=98116660; PubMed=9455482;
Kasahara Y., Nakai S., Ogasawara N., Yata K., Sadaie Y.;
Kasahara Y., Nakai S., Ogasawara N., Yata K., Sadaie Y.;
"Sequence analysis of the groESL-coth region of the Bacillus
genome, containing the restriction/modification system genes.
DNA Res. 4:335-339(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=94282319; PubMed=8012595;
Voelker U., Engelmann S., Maul B.
Schmid R., Mach H., Hecker M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Nucleotide sequence and analysis of the Bacillus subtilis chromosome."; Microbiology 143:1861-1866(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Isolation and characterization of the groES Bacillus subtilis Marburg.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Cloning and characterization of the subtilis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           groESL operon from Bacillus subtilis.";
J. Bacteriol. 174:3993-3999(1992).
                                                                                                                                                                                                                                                                                                               MEDLINE=93123969; PubMed=1362210; Voelker U., Mach H., Schmid R., F
                                                                                                                                                                                                                                                                                                                                          STRAIN=IS58;
                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                              Microbiology 140:741-752(1994).
                                                                                                                                                                                                                                                                                                                                                                                           subtilis."
                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-IS58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 1-30.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ogasawara N.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=97346038; PubMed=9202461; Sadaie Y., Yata K., Fujita M., Sagai H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-168 / MARBURG;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 1-18 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Biosci. Biotechnol. Biochem. 56:1995-2002(1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tozawa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=168 / MARBURG;
MEDLINE=93129852; PubMed=1369494;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        J. Bacteriol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=92283753;
                                                                                                                                                                                                                        +
                                                                                                                                                                                                                                                                                                                                                                                                      "Analysis of the induction of general stress
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6
                                                                                                                                                                                                                                                                                                  "Stress proteins and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5
                                                                                                                                                                                          FUNCTION: PREVENTS MISFOLDING AND PROMOTES BROPER ASSEMBLY OF UNFOLDED POLYPEPTIDES GE CONDITIONS (BY SIMILARITY).

7 SUBUNIT: OLICOMER OF 14 SUBUNITS COMPOSED C 7 SUBUNITS (BY SIMILARITY).

SIMILARITY: BELONGS TO THE CHAPERONIN (HSPE
Wong
                                                                                         an
                                                                                                                                                                                                                                                                                                                                                       OF,
                                                                                       email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Yoshikawa H.,
                                                                                                                                                                                                                                                                                                                                                      1-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ß
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        174:3981-3992(1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PubMed=1350776
                                                                                                                                                                                                                                                                                                  Schmid R., Hecker M. cross-protection by
                                                                                                                                                                                           TO THE CHAPERONIN (HSP60) FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kawamura F.,
                                                                                                                                                                                                                                                                                                                                                                                                                              в.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of
                                                                                                                                                                                                                                                                                                                                                                                                                                Riethdorf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                groESL operon from Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Itaya M., Takahashi H.;
                                                                                                                                                                                                                                                                                                   heat shock and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       phoB-rrnE-groESL region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Itaya
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                s.,
                                                                                                                                                                                                                                                GENERATED
                                                                                                                                                                                                                                                                                                                                                                                                      proteins
                                                                                                                                                                                                                      OF.
                                                                                                                                                                                                                                                            THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               M., Kasahara
                                                                                                                                                                                                                      TWO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                 Voelker
                                                                                                                                                                                                                                              REFOLDING
                                                                                                                                                                                                                      STACKED
                                                                                                                                                                                                                                                                                                                                                                                                        of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          genes
                                                                                                                                                                                                                                                                                                   salt
                                                                                                                                                                                                                                                                                                                                                                                                        Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                 Α.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            subtilis .";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of
                                                                                                                                                                  collaboration
                                                                                                                                                                                                                      RINGS
                                                                                                                                                                                                                                                STRESS
                                                                                                                                                                                                                                                             AND
                                                                                                                                                                                                                                                                                                   stress
                                                                                                      .ch/announce/
                                                                                                                                                       outstat ion
                                                                                                                  commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of
                                                                                                                                          9
                                                                                                                                                                                                                      QF
                                                                                                                                          its
```

```
PIR; B41884; B41884.

JR PIR; B41885; B41885.
DR PIR; JC1372; JC1372.
DR HSSP; D66139; 1GRL.
DR SUBTILIST; BG010423; MOPA.
DR INTERPRO; IPRO012423; MOPA.
DR INTERPRO; IPRO012423; MOPA.
DR PRINTS; PR00296; CHAPERONIN60.
PRINTS; PR00296; CHAPERONINS_CPN60; 1.
PROSITE; PS00296; PROSITE; 1.
PROSITE; PS00296; 
                                                                                                                      밁
                                                                                                                                                                         ρ
                                                                                                                                                                                                                                             닭
                                                                                                                                                                                                                                                                                                                                                                   рь
                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match 52.7%; Score 1398.5; DB 1; Length 543; Best Local Similarity 53.6%; Pred. No. 3e-60; Matches 281; Conservative 96; Mismatches 144; Indels 3;
481 TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP 524
| :::| |::|| |||||::|| ||||| ||| |||
478 TGEWVNMIEKGIVDPTKVTRSALQNAASVAAMFLTTEAVVADKP 521
                                                                                                                                                                                                                                         421 NKVAA----VEAEGDAQTGINIVLRALEEPIRQIAHNAGLEGSVIVERLKNEEIGVGFNAA 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                   RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AKEIKFSEEARRAMLRGVDALADAVKVTLGPKGRNVVLEKKFGSPLITNDGVTIAKEIEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1;
```

Search completed: January Job time: 336 sec Ç 2001, 14:31:05

```
Result
No.
                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                     Database
                                                                                                                                                                                                                                                                                                                                                      Minimum
                                                                                                                                                                                                                                                                                                                                                                                                     Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                         Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                 Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OM protein - protein search, using sw
                                                                                                                                                                                                                                                                                                                                                                   otal number of
 on:
                                                                                                                                                                                                                                             Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                              DB
Bd
1387
1384.5
1384.5
1369
1365.5
1359
1344
1337
                                                                                                                   1543.5
1543.5
1543.5
1543.5
1454.5
                                                                                                                                              1620.5
1574.5
1574.5
1543.5
                                                      1401
1399
1398.5
1392.5
                                                                                  1410.5
1402.5
                                                                                                                                                                                2223
1643.5
                                                                                                                                                                                                            Score
                                                                                                1422
                                                                                                                                                                          1642
                                                                                                                                                                                                                                                                                                                                             seq
                                                                                                                                                                                                                                                                                                                                             length:
                                                                                                                                                                                                                                                                                                                                                     length:
                                                                                                                                                                                                                                                                         PIR_66:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*
                                                                                                                                                                                                                  Query
                                                                                                                                                                                                                                                                                                                                                                  hits satisfying chosen parameters:
                                                                                                                                                                                                            Match
 2654
                                                                                                                                                                                                                                                                                                                                                                                                     BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                195891 seqs,
                                                                                                                                                                                                                                                                                                                                                                                              Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-461-774-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                            January
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                   SKLIEYDETARRAMEVGMDK.....VVVDKPAKAEDHDHHHGHAH
                           . . . . . 0
                                                                                                                                                                                                            Length DB
                                                                                                                                                                                                                                                                                                                                              2000000000
5, 2001, 14:24:19;
                                                                                                                                                                                                                                                                                                                                                                                67900655 residues
                                                                                                                                                                                                                                                                                                                                                                                             Gapext 0.5
                          B49855
G75499
B41872
$22342
$41884
JQ1195
B44425
$34938
JC5130
                                                                                                                                                                               F70737
S25181
B41325
                                                                                                            S68249
S72614
                                                                                                                                              A43509
C41325
                                                                                              JC6063
H72367
                                                                                                                                  T44725
                                                                                                                                                                    S37566
                                                                                                                                                                                                            ij
                                                                                                                           A25902
                                                                                                                                                            A26950
              JN0512
                                                                                                                                                                                                                                SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         model
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Search time 67.42 Seconds (without alignments)
                                                                                                                                                                                                                                                                                                                                                                                                                                              541.836 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                   195891
                                                                                           chaperonin groEL h
chaperonin 60 - Th
chaperonin groEL -
groEL protein - Th
                  heat shock protein
heat shock protein
chaperonin groeL-2
chaperonin-like pr
                                                                                                                                                           chaperonin cpn60
groEL1 protein
groEL2 protein
                                                                                                                                                                                heat shock
heat shock
                                                                                groEL protein - Th
heat shock protein
groEL protein - De
                                                                                                                                heat shock protein
heat shock protein
chaperonin 60K (im
                                                             chaperonin
58K heat sh
                                                                                                                  65K antigen -
chaperonin gro
      chaperonin
                                                chaperonin
                                                      heat shock
                                                                           heat shock
                                                                                                                                                    65K antigen mbaA
                                                                                                                                                                                               chaperonin
                                                                                                                                                                                                           Description
                                                             heat shock pro
                                                protein
                                                                     protein
HSP60 -
groEL
                                                                                                                                                                                              groEL1
                                                                                                                                                                                                                                                                                                                                                                                                                   538
                                                                    HSP60
                                                                                                                                                                         cpn60
                                                                                                                                                                                protein
                                                                                                                                                                                       protein
                                                                                                                  мусо
oEL_h
```

ALIGNMENTS

R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; H. Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998

Whitehead, S.; Barrell, B.G. tuberculosis from the complete

geno

Holroyd,

C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000 C;Accession: F70737; B47292; S18041

N; Alternate names: 65K antigen; chaperonin-60;

Mycobacterium tuberculosis (strain H37RV) 65K antigen; chaperonin-60; KCS protein

Species: Mycobacterium tuberculosis

chaperonin groEL1 -

```
A;Cross-references: GB:Z77165; GB:AL123456; NID:g3261609; PIDN:CAB01006.1; PID:g14493 A;Experimental source: strain H37Rv R;Kong, T.H.; Coates, A.R.; Butcher, P.D.; Hickman, C.J.; Shinnick, T.M. Proc. Natl. Acad. Sci. U.S.A. 90, 2608-2612, 1993 A;Title: Mycobacterium tuberculosis expresses two chaperonin-60 homologs.
                                                                                                                                                                                                                                                                                                                                                                                           C;Genetics:
A;Gene: groEL1
C;Superfamily: chaperonin groEL
C;Keywords: molecular chaperone
  Дb
                                         δõ
                                                                                            밁
                                                                                                                                   Qy
                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: EMBL:X60350; NID:g44599; PIDN:CAA42909.1; PID:g44601
A;Note: sequence extracted from NCBI backbone (NCBIN:128605, NCBIP:128608)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-466,'K',468-539 <KON>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Reference number: A47292; MUID:93219332
A;Accession: B47292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
A; Residues: 1-539 <COL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; A; Title: Deciphering the biology of Mycobacterium A; Reference number: A70500; MUID:98295987 A; Accession: F70737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Status: nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
  122
                        121 AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                          61
                                                                                            62
                                                                                                                                                                                        2
                                                                                                                                                                                                         1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                       EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
AADAVSEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMSKVGHDGVVSVEESSTL
                                                                                                                                                                                      SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 61
                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                      98.0%;
98.1%;
                                                                                                                                                                                                                                                                                5.
                                                                                                                                                                                                                                                                                                   Score 2602; DB 2
Pred. No. 2e-134;
                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                            2;
                                                                                                                                                                                                                                                                                <u>ن</u>
                                                                                                                                                                                                                                                                                                                            Length 539;
                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                             Gaps
181
                                                                                                                                                                                                                                                                                0;
```

```
neat shock protein groEL - Mycobacterium leprae
N;Alternate names: protein B229_C3_248
C;Species: Mycobacterium leprae
C;Date: 03-Feb-1994 #com
C;Accession: 77
                                                                                      A; Genetics: (C; Genetics: A; Gene: groEl A; Note: this C; Genetics: A; Gene: groEl A; Gene: gro
                   A; Note:
C; Superf
C; Keywor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Molecule type: DNA
Residues: 1-500 <SMI>
Cross-references: EMBL:U00015
A;Experimental source: cosmid B1620
A;Genetics: G2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               submitted to the EMBL Data Library,
A;Description: Mycobacterium leprae
A;Reference number: $72580
A;Accession: $72819
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Date: 03. Feb-1994 #sequence_revision 03-Feb-1994 C;Accession: S25181; S72819; S72998 R;de Wit, T.F.R.; Bekelie, S.; Osland, A.; Miko, T. Mol. Microbiol. 6, 1995-2007, 1992 A;Title: Mycobacteria contain two groEL genes: the A;Reference number: S25180; MUID:92374850 A;Accession: S25181
                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
A; Residues: 1-537 <SI
                                                                                                                                                                                                                                                                                                                                 A; Reference number: S:
A; Accession: S72998
A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                  submitted to the EMBL Data Library, A; Description: Mycobacterium leprae A; Reference number: $72580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                        A; Experimental source:
                                                                                                                                                                                                                                                              A; Cross · references:
                                                                                                                                                                                                                                                                                                                                                                                                                                                          R; Smith, D.R.; Robison,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Genetics: G1
R; Smith, D.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
A; Residues: 1-537 <DEW>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                            Superfamily: chaperonin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cross-references: EMBL:211665; NID:g44408; PIDN:CAB62574.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481 TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                              groEL
                                                                                           groE1
                                                                  cosmids B1620 and
                                                                                                                                          this groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLGERLAKLAGGVAVIKVGAATETALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DAGMVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRAKHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGQVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTELEFTEGIGFDKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                         G2
<G1>
                                                                                                                                                                                                                                                                                       1-537 <SMW>
                        molecular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Robison,
                                                                                                                                          gene
                                                                                                                                                                                                                                                              EMBL: U00020; NID: 9467102;
                      chaperone
                                                                                                                                                                                                                                          cosmid
                                                                                                                                          ş
                                              groEL
                                                                                                                                          arranged
                                                                                                                                                                                                                                          B229
                                                                                                                                          'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          November 1993 cosmid B1620.
                                                                                                                                                                                                                                                                                                                                                                                                           November 1993 cosmid B229.
                                                                                                                                          an
                                                                                                                                          operon
                                                                                                                                                                                                                                                                 PIDN: AAA17312.1;
                                                                                                                                          with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      T.L.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       second Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hermans,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PID: g6562688
                                                                                                                                                                                                                                                              PID:g467130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      P.W.M.; van
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     21-Jul-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Soolingen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       groEL ger
                                       8
В
                                                                                           ₽
                                                                                                                                     20
                                                                                                                                                                                                                                                                                                             C; Superfamily:
                                                                                                                                                                                                                                                                                                                                      A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QY
                                                                                                                                                                                                                                                                                                                                                            ;Genetics:
                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                         Local Sir
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                           Ν
                                                                                                                                                                                                                                                                                                                                      groEL1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          443;
```

```
heat shock protein 58 - Streptomyces albus N;Alternate names: heat shock protein groEL homolog 1 C;Species: Streptomyces albus C;Date: 17-Jul-1992 #sequence_revision 17-Jul-1992 #text_change
                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-540 <MAZ>
                                                                                                                                                                                                                                                                     A; Cross-references: GB:M76657;
            61 EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVARETEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
DDPYENLGAQLVKEVATKTNDIAGDGTTTATVLAQALVREGLRNVAAGASPAALKKGIDA
                                                                AKILKFDEDARRALERGVNQLADTVKVTIGPKGRNVVIDKKFGAPTITNDGVTIAREVEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GAALKQLRTSLTGDEALGIDVFFEALKAPLYWIATNAGLDGAVVVDKVSGLPAGHGLNAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ETGLVLREVGTDVLGSARRVVVSKDDTIIVDGGGSNDAVAKRVNQLRAEIEVSDSEWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKPLLIVAEDLEGEALATLVVNSIRKTLKAVAVKSPFFGDRRKAFLEDLAIVTGGQVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DTELEFTEGVGFDKGFLSAYFVTDFDSQQAVLDDPLVLLHQEKISSLPELLPMLEKVTES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AADAVSEALLAVATPVAGKDAITQVATVSSRDEQIGALVGEGMNKVGTDGVVSVEESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKLIEYDETARHAMEVGMNKLADTVRVTLGPRGRHVVLAKAFGGPTITNDGVTVAREIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EDPFENLGAQLVKSVATKTNDVAGDGTTTATVLAQALVKGGLRMVAAGANPVALGAGISK
                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                    chaperonin
                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                61.9%;
                                                                                                                                                                                                                  groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 83.8%;
82.3%;
                                                                                                                                                                                                                                                                     NID:g153290;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 48;
                                                                                                                                  87;
                                                                                                                                Score 1643.5;
Pred. No. 2.6e
37; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 2223; DB 2;
Pred. No. 7.9e-114;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                    Thompson,
                                                                                                                                                                                                                                                                      PIDN: AAA26753.1;
                                                                                                                                                                                                                                                                                                                                                       genes
                                                                                                                                              5; DB
                                                                                                                                  119;
                                                                                                                                                                                                                                                                                                                                                        İ'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 45;
                                                                                                                                                                 2
                                                                                                                                                                                                                                                                                                                                                                                         С.Л.
                                                                                                                                                                                                                                                                                                                                                        Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                  Indels
                                                                                                                                                                Length
                                                                                                                                                                                                                                                                 PID:9153292
                                                                                                                                                                   540;
                                                                                                                                                                                                                                                                                                                                                                                                                         26-Aug-1999
                                                                                                                                  ر
د
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <del>-</del>∾
                                                                                                                                                                                                                                                                                                                                                        albus
                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                  61
                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1.80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                  4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2
```

```
Chaperonin cpn60 - Streptomyces coelicolor
C.Species: Streptomyces coelicolor
C.Species: Streptomyces coelicolor
C.Date: 05-Nov-1999 #sequence_revision 05-Nov-1999 #text_change 11-Jan-2000
C.Accession: T35591
R.Saunders, D.; Harris, D.; Parkhill, J.; Barrell, B.G.; Rajandream, M.A.
Submitted to the EMBL Data Library, August 1998
A; Reference number: Z21583
A; Reference number: Z21583
A; Accession: T35591
A; Molecule type: DNA
A; Molecule type: DNA
A; Molecule type: DNA
A; Residues: 1-541 <SAU)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                   γ
                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                     δõ
                                                B
                                                                                             뫄
                                                                                                                                          Вb
                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
   밁
                                                                                                                                                                                                                                                                                    A; Experimental source: strain A3(2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                        Genetics:
Gene: groEL1; SCOEDB:SC6G4.40
Gene: groEL1; chaperonin groEL
                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 327; Conserv
   182
                         181
                                                 122
                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                             62
                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKV--A
                                                                                           SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                H 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GLELDFTEGMAFDKGYLSPYFVTDQERMEAVLDDPYILINQGKISSIADLLPLLEKVIQA
                                                           AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                           AKILKFDEDARRALERGVNKLADTVKVTIGPKGRNVVIDKKFGAPTITNDGVTIAREVEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AEEVGLKLDQAGLDVLGTARRVTVTKDDTTIVDGGGNAEDVQGRVAQIKAEIESTDSDWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NPDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWD
                                              AVAAVSEDLLATARPIDEKSDIAAVAALSAQDQQVGELIAEAMDKVGKDGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REKLQERLAKLAGGYCVIRVGAATEVELKERKHRLEDAISATRAAVEEGIVSGGGSALVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -AVKVLDD-NLGRTGDEATGVAVVRRAAVEPLRWIAENAGLEGYVITTKVAELDKGQGFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AVAAVSAELLDTARPIDDKSDIAAVAALSAQDKQVGELIAEAMDKVGKDGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                          Conservative
                                                                                                                                                                                      61.9%; Score 1642; DB 2; 60.3%; Pred. No. 3.1e-82; tive 92; Mismatches 117;
                                                                                                                                                                                                                                                                                      A3(2)
                                                                                                                                                                                                                                                                                                 PIDN:CAA20418.1; GSPDB:GN00070; SCOEDB:SC6G4.40
                                                                                                                                                                                                              Length 541;
                                                                                                                                                                                         Indels
                                                                                                                                                                                         6;
                       238
                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           418
                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     238
                                                                                                                                                                                         ω
••
                       DЬ
                                                                                                                  g
                                                                                                                                                                                     Qγ
δÃ
                                            Ş
                                                                      망
                                                                                        Ş
                                                                                                                                       Š
                                                                                                                                                                망
                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
```

```
groEL1 protein - Streptomyces coelicolor
C;Species: Streptomyces coelicolor
C;Species: Streptomyces coelicolor
C;Species: 06-Jan-1995 #sequence_revision 06-Jan-1995 #text_change 26-Aug-1999
C;Accession: S37566
R;Duchene, A.M.; Kieser, K.; Hopwood, D.; Thompson, C.; Mazodier, P.
submitted to the EMBL Data Library, September 1993
A;Description: Molecular characterization of two groEL genes in Streptomyces A;Reference number: S37564
A;Accession: S37564
A;Accession: S37564
A;Accession: S37564
A;Cession: S37564
A;Cession: S37564
A;Residues: Preliminary
A;Molecule type: DNA
A;Residues: 1-540 CDUC>
A;Cross-references: EMBL:X75206; NID:g406595; PIDN:CAA53019.1; PID:g406598
C;Superfamily: chaperonin groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity 60.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540
                     359
                                                      301
                                                                                                                           241
                                                                                                                                                          239
                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                302
                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             359
                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                   REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH 418
                                                  HS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ΑН
                                                                                                                                         GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKV--A
                                                                                                                                                                                                                                                           AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                   EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AATGEYGDLVKAGVIDPVKVTRSALENAASIASLLLTTETLVVEKKEEEEPAAGGHSHGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAED--HDHHHGH 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AVK--VLEGNLGKTGDEATGVAVVRRAAVEPLRWIAENAGLEGYVITSKVADLDKGQGFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NASKPLLIIAEDLEGEALSTLVVNKIRGTFNAVAVKAPGFGDRRKAMLQDMAVLTGATVI
                                                                                                                                                                                            GLELDFTEGMAFDKGYLSPYFVTDQERMEAVLDDPYILINQGKISSIADLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                  EDPYENLGAQLVKEVATKTNDIAGDGTTTATVLAQALVREGLKNVAAGASPALLKKGIDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REKLQERLAKLAGGVCVIKVGAATEVELKERKHRLEDAISATRAAVEEGIVSGGGSALVH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NPDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61.1%; Score 1620.5; DB 2; 60.0%; Pred. No. 4.6e-81; tive 92; Mismatches 118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Streptomyces coelicol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                          298
                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             418
                                                      360
                                                                                        358
                                                                                                                                                                                            240
                                                                                                                                                                                                                              238
                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4;
```

```
A;Cross-references: GB:AL021932; GB:AL123456; NID:g3261527; A;Experimental source: strain H37Rv C;Genetics: A;Gene: groEL2; Rv0440 C;Superfamily: chaperonin groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Cross-references: GB:M15467; NID:g149999; PIDN:AAA88232.1; PID:g150000 R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N. Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, F. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the com A;Reference number: A70500; MUID:98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Species: Mycobacterium tuberculosis bate: 02-un-1988 #sequence_revision raccession: A26950; A70830 R;Shinnick, T.M.
J. Bacteriol. 169, 1080-1088, 1987
                                                                                                                                   Ş
                                                                                                                                                                      Дb
                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                        Ъ
įΘ
                                      В
                                                              ρ
                                                                                                      В
                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                   õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Status: preliminary; nucleic acid sequence not shown; translation not A;Molecule type: DNA A;Residues: 1-540 <COL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 1-540 <SHI>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          J. Bacteriol. 169, 1080-1088, 1987
A;Title: The 65-kilodalton antigen of Mycobacterium
A:Reference number: A26950; MUID:87137260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Accession: A70830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Accession: A26950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               groEL2 protein - Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Alternate names: 65K antigen
   301
                                                                                                       182
                                                                                                                                       181
                                                                                                                                                                        122
                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                         N
                                                     GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                     GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                       AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                           DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                    GKPLLITAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVISE
                                                                                                  GIQLELTEGMREDKGYISGYEVTDPERQEAVLEDPYILLVSSKVSTVKDLLPLLEKVIGA
                                                                                                                                                                      AVEKVTETLLKGAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                    AH 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AVK--VLEGNLGKTGDEATGVAVVRRAAVEPLRWIAENAGLEGYVITSKVADLDKGQGFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REKLQERLAKLAGGVCVIKVGAATEVELKERKHRLEDAISATRAAVEEGIVSGGGSALVH
                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                        59.3%; Score 1574.5; DB 2; 61.2%; Pred. No. 1.5e-78; tive 75; Mismatches 126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              02-Jun-1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Whitehead, S.; Barrell, B.G. tuberculosis from the complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 H37RV)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Skelton, S.; Squares, S.
                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIDN:CAA17397.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20-Jun-2000
                                                                                                                                                                                                                                                                                                                                                                        ω,
                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                      241
                                                                                                                                     240
                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PID:g29095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Holroyd,
                                                                                                                                                                                                                                                                                                                                                                        2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gordon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ຜ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R;Thole, J.E.R.; Keulen, W.J.; Kolk, A.H.J.; Groothuis, D.G.; Berwald, Infect. Immun. 55, 1466-1475, 1987
A;Title: Characterization, sequence determination, and immunogenicity cap; Reference number: A43509; MUID:87193155
                                                                   В
                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Molecule type: DNA
A;Residues: 1-540 <THO>
A;Cross-references: GB:M17705; NID:g149933; PIDN:AAA25358.1;
C;Superfamily: chaperonin groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Species: Mycobacterium bovis
C;Date: 28-Oct-1992 #sequence_revision 28-Oct-1992 #text_change 26-Aug-1999
C;Accession: A43509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
A43509
      맑
                                Qy
                                                                                                                                     В
                                                                                                                                                               ρy
                                                                                                                                                                                                     В
                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Accession: A43509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65K antigen mbaA - Mycobacterium bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
      479
                                                                   421
                                    481
                                                                                                    421
                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                     362
                                                                                                                                                                    361
                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                        121 AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                      TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                      KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                   GLQLELTEGMRFDKGYISGYFYTDPERQEAVLEDPYILLVSSKVSTVKDLLPLLEKVIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EVGLTLENADLSLLGKARKVVVTKDETTIVEGAGDTDAIAGRVAQIRQEIENSDSDYDRE
      TGVYEDLLAAGVADPVKVTRSALQNAASIAGLFLTTEAVVADKPEK
                                                                     APTLDELK--LEGDEATGANIVKVALEAPLKQIAFNSGLEPGVVAEKVRNLPAGHGLNAQ
                                                                                                    RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                     KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                                                                                                                                                                                                                                                                                                                                                                       AVEKVTETLLKGAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGVYEDLLAAGVADPVKVTRSALQNAASIAGLFLTTEAVVADKPEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APTLDELK - - LEGDEATGANIVKVALEAPLKQIAFNSGLEPGVVAEKVRNLPAGHGLNAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59.3%;
61.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 1574.5; DB
Pred. No. 1.5e-78;
5; Mismatches 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         immunogenicity of a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   524
      524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PID:g149934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              L.G.; Tiesjema
                                                                       478
                                                                                                                                     420
                                                                                                                                                                                                       361
                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                      30C
                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              64-kilodal
```

2;

```
RESULT 9
$40245
$40245
heat shock protein 65 - Mycobacterium paratuberculosis C:Species: Mycobacterium paratuberculosis C:Date: 06-Jan-1995 #sequence_revision 06-Jan-1995 #te) C:Accession: $40245
R:COLSTON, X.Y.Z.; McConnell, X.Y.Z.; Bujdoso, R. submitted to the EMBL Data Library, August 1993
A;Description: Cloning and expression of Mycobacterium A;Reference number: $40245
                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                               Š,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Molecule type: DNA
A;Residues: 1-540 <MAZ>
A;Cross references: GB:M76658; NID:g153293; PIDN:AAA26754.1; PID:g153294
C;Genetics:
A;Cene: groEL2
A;Gene: groEL2
C;Superfamily: Chaperonin groFF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R;Mazodier, P.; Guglielmi, G.; Davies, J.; Thompson, J. Bacteriol. 173, 7382-7386, 1991
A;Title: Characterization of the groEL-like genes in A;Reference number: A41325; MUID:92041639
A;Accession: C41325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            heat shock protein 56 - Streptomyces albus
N;Alternate names: heat shock protein groEL homolog 2
C:Species: Streptomyces albus
C:Date: 17-Jul-1992 #sequence_revision 17-Jul-1992 #text_change 26-Aug-1999
C:Accession: C41325
                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Mat
Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Superfamily:
                                                                                                                                                                                                      479
                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Match
                                                                                                                                                                                                                                                                                                                                                     KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                    GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GLELELTEGMRFDKGYISAYFATDMERMEASLDDPYILIVNSKIGNVKDLLPLLEKVNQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA 527
                                                                                                                                                                                                                                                                  SSVFEKL--ELEGDEATGAAAVKLALEAPLKQIAVNGGLEGGVVVEKVRNLSVGHGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                  EVGLKLENAGLDLLGRARKVVITKDETTIVDGAGDTDQVNGRVAQIRAEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLGDIAILTGGTVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                    KLQERLANVAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALL-QA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AKIIAFDEEARRGLERGMNQLADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 chaperonin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                58.2%;
nilarity 59.6%;
Conservative 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  79; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. 7.1e-77;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  131;
                                                                                   #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                  paratuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                      525
                                                                                   26-Aug-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               albus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                   478
                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                  360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                    HSP65KD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
```

```
submitted to the EMBL Data Library, A; Reference number: 22831
A; Accession: T44725
A; Status: preliminary; translated fr. A; Molecule type: DNA
A; Molecule type: DNA
A; Residues: 1-541 < JAM>
A; Residues: 1-541 < JAM>
A; Experimental source: cosmid B1450
C; Genetics:
                                                                                                                                                                                                            chaperonin 60K [imported] - Mycobacterium leprae k; Alternate names: heat shock protein GroEL-2 C; Species: Mycobacterium leprae C; Species: Mycobacterium leprae C; Date: 21-Jan-2000 #sequence_revision 21-Jan-200 C; Accession: T44725
R; James, K.D.; Parkhill, J.; Barrell, B.G.; Rajar
                                                                                                                                                                                                                                                                                                                         RESULT
T44725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Accession: S40245
A;Status: preliminary
A;Nolecule type: DNA
A;Residues: 1-541 <COL>
A;Cross-references: EMBL:X74518; NID:g438180; PIDN:CAA52630.1;
C;Superfamily: chaperonin groEL
A;Gene: groEL-2
C;Superfamily: chaperonin groEL
C;Keywords: molecular chaperone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
Matches 316; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                479
                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EVGLSLESADISLLGKARKVVVTKDETTIVEGAGDSDAIAGRVAQIRTEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEDPFILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EDPFEDLGAQLVKSVATKINDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                              TGEYEDLLKAGIADPVKVTRSALQNAASIAGLFLTTEAVVADKPEKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IPALDELKPE--GEEATGANIVRVALERPLKQIAFNGGLEPGVVAEKVRNSPAGTGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALLH-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLFLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AVEKVTETLLKSAKEVETKDQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREGLRNVAAGANPLGLKRGIEK 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            58.2%; Score 1543.5; DB 2; 60.0%; Pred. No. 7.1e-77; tive 78; Mismatches 130;
                                                                                                                                                                                               Library,
                                                                        B1450
                                                                                                                                             from
                                                                                         PIDN:CAA22689
                                                                                                                                                                                               January
                                                                                                                                                                                                                                                 21-Jan-2000 #text_change
                                                                                                                                             GB/EMBL/DDBJ
                                                                                                                                                                                               Rajandream,
1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                   M.A
                                                                                                                                                                                                                                                                                                                                                                                              525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PID:g438181
                                                                                                                                                                                                                                                       18-Feb-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
```

Query Match Best Local Similarity

58.2%; 60.1%;

Score Pred.

1543.5; DB No. 7.1e-77;

2;

Length

48C 467 420 408 360 348

```
osk antigen - Mycobacterium leprae
C;Species: Mycobacterium leprae
C;Date: 02-Jun-1988 #sequence_revision 02-Jun-1988 #text_chance: 02-Jun-1988 #tex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
A; Residues: 1-588 <MEH>
C; Superfamilu: ~--
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Superfamily: chaperonin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                              181
                                                                                  169
                                                                                                                                   121
                                                                                                                                                                                       109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                             49
                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N
                                                                                                                                                                                                                                                                                                                        AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
     GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                               AVDKVTETLLKDAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                EDPFEDIGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                             AKTIAYDEEARRGLERGLNSLADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APALDKLK--LTGDEATGANIVKVALEAPLKQIAFNSGMEPGVVAEKVRNLSVGHGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EVGLTLENTDLSLLGKARKVVMTKDETTIVEGAGDTDAIAGRVAQIRTEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                       EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVKEGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TGEYEDLLKAGVADPVKVTRSALQNAASIAGLFLTTEAVVADKPEK 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKSLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGAQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GLQLELTEGMRFDKGYISGYFYTDAERQEAVLEEPYILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AVDKVTETLLKDAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AKTIAYDEEARRGLERGLNSLADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVKEGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                        316;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         316;
                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                           58.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   groEL
                                                                                                                                                                                                                                                                                                                                                                                                     77;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         77;
                                                                                                                                                                                                                                                                                                                                                                                                                           Score 1543.5; DB 2; Pred. No. 7.9e-77;
                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                     130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #text_change 12-Sep-1997
  <del>::</del>
::
                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
     =
=
=
=
                                                                                                                                                                                                                                                                                                                                                                                                  ω
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω
••
                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                             108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      480
                                                                                                                                                                                       168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chaperonin groEL homolog cpn60 - Clostridium thermocellum N;Alternate names: heat shock protein groEL homolog cpn60 C;Species: Clostridium thermocellum C;Date: 24-Aug-196 #sequence_revision 13-Mar-1997 #text_change :C;Accession: 568249; S68277 C;Accession: 568249; S68277 R;Ciruela, A.; Cross, S.; Freedman, R.B.; Hazlewood, G.P. submitted to the EMBL Data Library, November 1995 A;Reference number: 568248 A;Accession: 568249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R;Cross, S.J.; Ciruela, A.; Poomputsa, K.; Romaniec, M.P.M.; Fi
Blochem. J. 316, 615-622, 1996
A;Title: Thermostable chaperonin from Clostridium thermocellum.
A;Reference number: S68277; MUID:96257758
A;Accession: S68277
                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C; Superfamily: ch
C; Keywords: heat
F; 2-541/Product:
δÃ
                                                    밁
                                                                                                  Qy
                                                                                                                                                         В
                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                               Db
                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-541 <CIR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: protein A; Residues: 'X', 3-21 < CR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Cross-references: EMBL:268137; NID:g1103642; PIDN:CAA92242.1; PID:g1103644 R;Cross, S.J.; Ciruela, A.; Pomputsa, K.; Romaniec, M.P.M.; Freedman, R.B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Superfamily: chaperonin groEL; Superfamily: chaperonin groEL; Keywords: heat shock; molecular chaperone; stress-induced; 2-541/Product: chaperonin groEL homolog cpn60 #status expe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                            122
                                                    182
                                                                                                     181
                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         229
                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                          N
                                                                                                                                                                                                                                                                                                                                                                                                     groEl
                                                                                                                                                                                                           AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
  GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                 GTNLEIVEGMQEDRGYVSPYMVTDTEKMEAVLDEPYILITDKKISNIQDILPLLEQIVQQ
                                                                                                  GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLFDLLFLLEKVAGT
                                                                                                                                                         AVDAAVEGIKEISQKVKGKEDIARVASISANDEVIGELIADAMEKVTNDGVITVEEAKTM
                                                                                                                                                                                                                                                                                             EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EDPFENMGAQLVKEVATKTNDVAGDGTTTATLLAQAIIREGLKNVAAGANPMLLKKGIAK 121
                                                                                                                                                                                                                                                                                                                                                                          AKQIKFGEEARRALERGVNQLADTVKVTLGPKGRNVVLDKKFGSPMITNDGVTIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TGEYEDLLKAGVADPVKVTRSALQNAASIAGLFLTTEAVVADKPEK 571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APALDKLK - - LTGDEATGANIVKVALEAPLKQIAFNSGMEPGVVAEKVRNLSVGHGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EVGLTLENTDLSLLGKARKVVMTKDETTIVEGAGDTDAIAGRVAQIRTEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEEPYILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               292;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative 102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <CRO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        54.8%;
55.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1454.5; DB 2;
Pred. No. 4.9e-72;
Pred. Mismatches 131;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             groEL
```

genes

from

Ch

Gaps

<u>ب</u> ٠٠

61 60

240 181 밁 Qy 밁 QY 밁 Ωy 멍 Qγ Ę д δÃ В Ωy В Q 밁 δÃ

ŕ Š В δÃ В γ В Qy

```
Chaperonin 60 - Thermoanaerobacter brockii
N;Alternate names: heat shock protein groEL homolog
C;Species: Thermoanaerobacter brockii
C;Date: 14-Feb-1997 #sequence_revision 14-Feb-1997 #te;
C;Accession: S72614, S45615
R;Truscott, K.N.; Scopes, R.K.
submitted to the EMBL Data Library, April 1996
A;Description: Cloning and sequence of the chaperonin
A;Reference number: S72613
A;Reference number: S72614
A;Molecule type: DNA
A;Residues: 1-541 <TRU>
A;Cross references: EMBL:U56021; NID:g1326189; pIDN:A
D:Truscott, K.N.; Hoj, P.B.; Scopes, R.K.
                                                                                                                                                                                                                                                                                                                                                                                                       R:Truscott, K.N.; Hoj, P.B.; Scopes, R.K.
Eur. J. Biochem. 222, 277-284, 1994
A:Title: Purification and characterization of A; Reference number: $45615; MUID:94291621
A; Accession: $45615
A; Molecule type: protein
A; Residues: 2-34, 'X', 36-43, 'A' <TRW>
C; Genetics:
A; Gene: groEl
C; Superfamily: chaperonin groEL
C; Keywords: molecular chaperone
F; 2-541/Product: chaperonin 60 #status experi
                              Qy
                                                                                            δÃ
                                                                                                                                                          δÃ
                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                            QΥ
                                                                 망
                                                                                                                                 Ъ
                                                                                                                                                                                                                             οy
                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                     ;Keywords: molecular chaperone;2-541/Product: chaperonin 60 #status experimental <MAT>
                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    422
     242
                                 241
                                                                   182
                                                                                                                                   122
                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   362
                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                 62
                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                           / Match 54.3%;
Local Similarity 55.1%;
les 292; Conservative 9
                                                                                                                                                                                                                                                               GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
|| |||:|:||||||:||:|| || || || || ||:|::||| ||::
GKKLLIIADDVEGEALATLIVNKLRGTFTCVAVKAPGFGDRRKEMLQDIAILTGGQVISE
                                                                                                                                                   AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                 GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                 AVDAAVEGLKRISKPIDNKESIAHVASISAADEEIGKLIAEAMDKVGKDGVITVEESKTL
                                                                                                                                                                                                                EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NEKYVNMIEAGIYDPAKVTRSALQNAASVASMVLTTESVVADIPEK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PK-VAKVLDTVSGDEKTGVQIILRALEEPVRQIAENAGLEGSVIVEKVKASEPGIGFDAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GTTLEVVEGMQFDRGYISPYMVTDAEKMEAVLEEPVILITDKKISNIQDLLPLLEQIVQQ
                                                                                                                                                                                                 EDPFENQGAQLLKEAATKTNDIAGDGTTTATLLAQAMVREGLKNLAAGANPMLLRRGIAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DLGLELKDTTVEQLGRARQVKVQKENTIIVDGAGDPKEIQKRIASIKSQIEETTSDFDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                             95;
                                                                                                                                                                                                                                                                                                                           Pred. No. 3e-7
5; Mismatches
                                                                                                                                                                                                                                                                                                                                                           Score 1440;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       chaperonin
                                                                                                                                                                                                                                                                                                                                           3e-71;
                                                                                                                                                                                                                                                                                                                                                        DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        chaperonin 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIDN: AAB00559.1;
                                                                                                                                                                                                                                                                                                                             135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      #text_change
                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      operon
                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        chaperonin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PID:g1326191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Thermoanaerobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26-Aug-1999
                                                                                                                                                                                                                                                                                                                             8,
                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                 121
   301
                                                                 241
                                                                                                 240
                                                                                                                                 181
                                                                                                                                                                 180
                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10
                                                                                                                                                                                                                                                                                                                             ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       broc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C:Species: Bacillus sp.
C:Date: 31-Dec-1996 #sequence_revision 31-De-
C:Accession: JC6063
R:Xu, Y: Zhou, P.J.
Acta Microbiol. Sin. 36, 241-249, 1996
A:Title: Phylogeny of molecular chaperone 60
A:Reference number: JC6063
A:Reference number: JC6063
A:Accession: JC6063
A:Residues: 1-544 <XUA>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Gene: groEL
C;Superfamily: chaperonin groEL
C;Keywords: molecular chaperone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
   DЪ
                              QУ
                                                                 В
                                                                                              δõ
                                                                                                                              В
                                                                                                                                                            Qy
                                                                                                                                                                                               В
                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                        ρ
                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Experimental C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  chaperonin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
   421
                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 478 YDAYKEEFTDMFKAGIVDPTKVTRTALQNAASIASMILTTEAIVVDIPEK 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 477
                                                                                                                                 302
                                                                                                                                                                 301
                                                                                                                                                                                                 242
                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                             122
                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                           N
                                                                                                                                                                                                                GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
 IKAVSSIGAE--GDEATGVNIVLRALEEPVRQIAHNAGLEGSVIVERLKKEEAGFGFNAA
                                 RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                  KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                 DLGLDLKSANITQLGRASKVVVTKENTTIVEGAGESDKIAARVNQIKAQIEETTSDFDKE
                                                                                                                                                  DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                             GKPILIIAEDVEGEALATLVVNKLRGTFNAVAVKAPGFGDRRKAMLEDIAILTGGEVITE
                                                                                                                                                                                                                                                             STELEVVEGMQFDRGYASPYMVTDSDKMEAVLDNPYVLITDKKISNIQEVLPVLEQVVQQ
                                                                                                                                                                                                                                                                                            GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                           ATQVAVEELSKISKPIEGKDSIAQVAAISSADDEVGKIIAEAMERVGNDGVITIEESKGF
                                                                                                                                                                                                                                                                                                                                         AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                            EDPFEDLGAQLVKSVATKINDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                           AKDIKFSEDARRSMLRGVDKLADAVKVTLGPKGRNVVLEKKFGSPLITNDGVTIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLQERLAKLAGGVAVLKVGAATETEMKERKLRIEDALNSTRAAVEEGIVAGGGTALVN-V
                                                                                                                                                                                                                                                                                                                                                                                          EDAFENMGAKLVAEVASKINDIAGDGTITATVLAQAMIREGLKNVTSGANPMVIRKGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EDVQKVVD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative 109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C-125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1423.5;
Pred. No. 2.4e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BD224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .4e-70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         135;
```

121

61

420

360 301

361

```
DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HQARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKV-SELPAGHG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KLQERLAKLAGGVAVIQAGAATETELKEKKHRIEDALAATKAAVEEGIVPGGGIALLNVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASL---I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ELGYDLKDVRLDMLGRARQVKVTKEYTTIVGGAGDPSEIKKRVNQIKAQIEETTSDYDRE
                                                                                                                                                                                                                                                                                                                                                          #sequence_revision 31-Dec-1996 #text_change 13-Sep-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                       Length
ω,.
Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
2
```

```
RESULT 15

#73567

Grozel protein - Thermotoga maritima (strain MSB8)

C;Species: Thermotoga maritima
C;Species: Thermotoga maritima
C;Aate: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 21-Ju1-2000
C;Aate: 13-367
C;Accession: #72367
R;Nelson, K.E.; Clayton, R.A.; Gill, S.R.; Gwinn, M.L.; Dodson, R.J.; Haft,
R;Nelson, K.E.; Clayton, R.A.; Cotton, M.D.; Pratt, M.S.; Phillips, C.A.; Ric
Search completed: January Job time: 249 sec
                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                  DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                Ŷ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              õ
                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Gene: TM0506
C; Superfamily: chaperonin groEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Experimental source: strain MSB8 C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 R;Nelson, K.E.; Clayton, R.A.; Gill, S.R.; Gwinn, M.L.; Dodson, R.J.; Haft, D.H.; Hickey Garrett, M.M.; Stewart, A.M.; Cotton, M.D.; Pratt, M.S.; Phillips, C.A.; Richardson, D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Title: Evidence for lateral gene transfer between Archaea and Bacteria from genome sec
A;Reference number: A72200; MUID:99287316
A;Accession: H72367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nature 399, 323-329, 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Status: preliminary
Molecule type: DNA
Residues: 1-538 <ARN>
Caross-references: GB:AE001727; GB:AE000512; NID:g4981015; PIDN:AAD35591.1; PID:g498101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                           480 NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAED 529 | :: |:||| |||||| ||:|:|| ||:|| ::: | ::| || ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::|| ::|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::: ||:|| ::|| ::: ||:|| ::: ||:|| ::: ||:
                                                                                                                                                                                                                                                                                                                                                           422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       183 TYVEFTEGMQFDRGYISPYFVTDAEKMEVVLKEPFILITDRKLSAVKPLIPILEKVAQTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481 TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAE 528
| : :: |::|| |||||: :|:|| | |||| |: ||
479 TGEWVNMVEAGIVDPTKVTRSALQHAASVSAMFLTTEAVIADKPEENE 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity 52.8 nes 280; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            w
                                                                                                                                                                                                                                                                                                                                                                                           KALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKV--SELPAGHGLNV 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDREK 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNPD 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEFTEGIGFHKGFLSAYFYTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGTG 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EKAVEEIKKVSKKLSGREDIAHVAAISANSAEIGELIAEAMDKVGEDGVITVEDSKTLE 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIELE 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LGINLEDLTLEDLGRADLVRVKKDETIIIGGKGDPEAIKKRIAQIKAQIEETTSEYEKET 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KPLLVIAEDVEGEVLTTLVLNKLKGTLQSCAVKAPGFGERRKAMLQDIAILTGGQVASEE 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGKA 121
                                                                                                                                                                                                                                                                                                                                                  KAVEKVIEELEGDEKIGAQIVYKALSAPIKQIAENAGYDGAVIIEKILSNDDPA-YGFDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTLG 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DKFENLGAQLVKEVASKTNDVAGDGTTTATVLAQAMIKEGLKNVAAGANPILLKRGIDKA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KILKFNEEARRALERGVDKVANAVKVTLGPKGRNVVIEKSWGSPTITNDGVSIAKEIELE 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   53.6%; Score 1422; DB 2; 52.8%; Pred. No. 2.8e-70; tive 124; Mismatches 122;
                                    5
                                    2001, 14:28:28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 538;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω
••
```

```
Page
```

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lotal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              on:
       Pred. No.
                                                                                                                                                                                       1574.5
1574.5
1574.5
1566.5
1566.5
1566.5
1543.5
1543.5
1543.5
1289
1289
1289
1289
                                                                                                                                      1284.5
1264.5
1083
   1082
1082
1082
1082
1082
1010
918.5
918.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                d. No. is the number of results predicted by chance to have a
re greater than or equal to the score of the result being printed,
is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     seq
seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Issued_Patents_AA:*

1: /cgn2_6/ptodata/2,

2: /cgn2_6/ptodata/2,

3: /cgn2_6/ptodata/2,

4: /cgn2_6/ptodata/2,

5: /cgn2_6/ptodata/2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
     BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    174772 seqs, 17957048 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-461-774-2
2654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            January 5, 2001, 14:23:48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKLIEYDETARRAMEVGMDK.....VVVDKPAKAEDHDHHHGHAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/ECTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
     DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gapext 0
 US-08-997-080-160
US-08-997-362-160
US-09-095-855-160
PCT-US94-06362-4
US-08-997-362-114
US-08-997-362-114
US-08-997-362-114
US-08-467-822-34
US-08-467-822-31
US-08-467-822-31
US-08-467-822-31
US-08-467-822-31
US-08-467-822-31
US-08-467-822-31
US-08-467-822-31
US-08-467-822-33
US-08-467-822-33
US-08-467-822-33
US-08-467-822-33
US-08-467-822-33
US-08-467-822-33
US-08-96-11373-1
US-08-96-11373-1
US-08-96-11373-1
US-08-96-11373-1
US-08-96-11373-1
US-08-96-11373-1
US-08-96-11373-1
US-08-997-080-162
US-08-997-362-1562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Search time 45.19 Seconds (without alignments) 213.784 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        174772
                 Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                     Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                         Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Description
                                                                                                                                                                                                                                                                                        Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
Sequence
 Sequence
20, Appl
32, Appl
31, Appl
6, Appl
6, Appl
6, Appl
10, Appl
11, Ap
                                                                                                                                                                                                                                                                                                                       160, App
160, App
160, App
1, Appli
1114, App
1114, App
1114, App
1114, App
114, Appl
```

οy

1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60

2;

Query Ma Best Loo Matches	थ बंद हिने पे के के वि के के	44 45 SULT	32 32 33 34 34 34 34 34 34 34 34 34 34 34 34
atch cal s 323	OF THE STAND STREET OF THE	334	910.5 910.5 910.5 910.662 662 662 359.5 341 341 341 340 340
imilarity ; Conserva	ATION ON AMADE IN A SECOND TO A SECOND TO A SECOND A SECO	12.	34.3 34.3 24.9 24.9 112.8 112.8
59.3% 61.3% vative	TA: TA: TA: TA: TA: TA: TA: TA:		309 309 309 215 215 215 215 217 112 112 112 112 112 112 112 112
; Sco ; Pro 79;	89970 S AND S AND f Ann nue, ndows 1100 ON:		2 US-08 3 US-08 3 US-08 3 US-08 3 US-08 3 US-08 3 US-08 3 US-08
ore 1574.5; ed. No. 5.76 Mismatches	97080 97080 AND COMPOUNDS F AND W. Speckman e, Suite 4185 e, Suite 4185 ows Version 2.0 997,080 997,080	08-473-020 08-473-020 08-473-020	US-08-997-080-118 US-08-997-362-118 US-99-095-855-118 US-09-095-855-117 US-08-997-362-117 US-08-917-362-117 US-08-116-098-2 US-08-997-362-78 US-08-997-362-78 US-08-997-362-78 US-08-997-362-80 US-08-997-362-80 US-08-997-362-80 US-08-997-362-80
5; DB 2 .7e-132; es 122;	O _R)A-25)A-22	0-118 0-118 0-118 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-117 0-118 0-118 0-118 0-119 0-
; Lengt Indels	THE TREA		
th 541; s 3;	TREATMENT OF	Sequence	Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence
Gaps	OOTON DWW 1		118, 118, 118, 117, 117, 117, 117, 117,
2;)TOGI	197	App App App App App App Appli Appli Appl Appl

ICALLY -

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 2
US-08-997-362-160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뮍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 160, Application Patent No. 5985287
                                                                                                                                        COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
SOFTWARE: FASTSEQ for Windows Version
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/997,362
FILING DATE:
                           APPLICATION NUMBER: U.S. Patent Application FILING DATE: August 29, 1996 ATTORNEY/AGENT INFORMATION:
                                                                          PRIOR APPLICATION DATA:
APPLICATION NUMBER: U.S. P.
FILING DATE: June 12, 1997
                                                                                                                                                                                                                                  COMPUTER READABLE FORM: MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Scott, Linda
APPLICANT: Prestlidge, Ross
TITLE OF INVENTION: COMPOUNDS
TITLE OF INVENTION: TREATMENT
NUMBER OF SEQUENCES: 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Hiyama, Jun
APPLICANT: Visser, Elizabeth
APPLICANT: Skinner, Margot
                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                              STREET: 2601 E
CITY: Seattle
STATE: WA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                         CLASSIFICATION:
                                                                                                                                                                                                                                                                COUNTRY: USA
ZIP: 98121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
NAME: Sleath, Janet REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RVGLSLETADVSLLGQARKVVVVTKDETTIVEGSGDSDAIAGRVAQIRAEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GLOLELTEGMRFDKGYISGYFVTDAERQEAVLEDPYILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APALDDL--GLTGDEATGANIVRVALSAPLKQIAFNGGLEPGVVAEKVSNLPAGHGLNAA 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVVSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TGEYEDLLKAGVADPVKVTRSALQNAASIAALFLTTEAVVADKPEKA 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREGLRNVAAGANPLGLKRGIEK 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INFORMATION:
                                                                                                                                                                                                                                                                                                                             2601 Elliott Avenue,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Tan, Paul
                                                                                                                                                                                                                                                                                                                                            Law Offices of Ann
                                                                                          U.S. Patent Application
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US/08997362
                                                                                                                                                                                                                                                                                                                                                                                         AND
                                                                                                                                                                                                                                                                                                                                Suite
                                                                                                                                                                                                                                                                                                                             W. Speckman
Suite 4185
                                                                                                                                                                                                                                                                                                                                                                                         METHODS FOR DIAGNOSIS OF
                                                                                                                                                                                                                                                                                                                                                                                           OF MYCOBACTERIAL INFECTIONS
                                                             NO.
                                                                                          No.
                                                             5985287
                                                                                            5985287
                                                             08/705,347
                                                                                            08/873,970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
```

```
INFORMATION FOR SEQ ID NO: 1
SEQUENCE CHARACTERISTICS:
LENGTH: 541 amino acids
TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
US-08-997-362-160
                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                 US-09-095-855-160
                                                                                                                                                                                                   Patent No. 6160093
                                                                                                                                                                                                                  Sequence 160, Application US/09095855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                       GENERAL
                                                                                                                        APPLICANT: Tan, Paul
APPLICANT: Visser, Elizabeth
APPLICANT: Skinner, Margot
APPLICANT: Prestidge, Ross
                                                                                 TITLE OF INVENTION: Compounds TITLE OF INVENTION: Treatment NUMBER OF SEQUENCES: 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELECOMMUNICATION INFORMATION: TELEPHONE: 206-269-0565
TELEFAX: 206-269-0563
                                                                   CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                          479
                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                        STREET: 2601 F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE/DOCKET NUMBER:
                                                       ADDRESSEE:
COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                       TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA 527
                                                                                                                                                                                                                                                                                                                                                                RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                       KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RVGLSLETADVSLLGQARKVVVTKDETTIVEGSGDSDAIAGRVAQIRAEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GLQLELTEGMRFDKGYISGYFYTDAERQEAVLEDPYILLVSSKVSTVKDLLPLLEKVIQA 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG'I 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                 APALDDL--GLTGDEATGANIVRVALSAPLKQIAFNGGLEPGVVAEKVSNLPAGHGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                        KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALL-QS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 323;
                                                                                                                                                                                      INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
             WΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541 amino acids
                                        2601 Elliott Avenue,
USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                       Law Offices of Ann W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              59.3%; Score 1574.5; DB 2;
61.3%; Pred. No. 5.7e-132;
70. Mismatches 122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            160:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11000.1002c2
                                                                                                                and
                                                                                                   and
                                                                                                Methods fo
Diagnosis
                                                      Speckman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 2;
                                                                                                   of Mycobacterial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ω
••
                                                                                                    Infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 2
```

Ţ,

```
δÃ
                            Qy
                                                                DЪ
                                                                                              Š
                                                                                                                                     В
                                                                                                                                                                                                    B
                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-095-855-160
                                                                                                                                                                                                                                                                                                                                                                                                     ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: 08/873,970
FILING DATE: 12-JUN-1997
APPLICATION NUMBER: 08/997,362
FILING DATE: 23-DEC-1997
ATTORNEY/AGENT INFORMATION:
NAME: Sleath, Janet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REGISTRATION NUMBER: 37,007
REFERENCE/DOCKET NUMBER: 111
TELECOMMUNICATION INFORMATION:
TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/7
FILING DATE: 29-AUG-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: FastSEQ for Windows Version CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/095,855
 479
                                 481
                                                                  421
                                                                                                                                     362
                                                                                                                                                                   361
                                                                                                                                                                                                    302
                                                                                                  421
                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                    182 GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEDPYILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                    121 AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           / Match 59.3%; Score 1574.5; DB 3;
Local Similarity 61.3%; Pred. No. 5.7e-132;
nes 323; Conservative 79; Mismatches 122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER: IBM CONTROL OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDIUM TYPE: Diskett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX: 206-269-0563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N
                                                                                                                                                   KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                  DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                      GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                         GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT 240
                                                                                                                                                                                                                                                                                                                                                                                                   TGEYEDLLKAGVADPVKVTRSALQNAASIAALFLTTEAVVADKPEKA 525
                 TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA 527
                                                                APALDDL--GLTGDEATGANIVRVALSAPLKQIAFNGGLEPGVVAEKVSNLPAGHGLNAA
                                                                                RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                   GKPLLITAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVVSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                 KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALL-QS
                                                                                                                                                                                                  RVGLSLETADVSLLGQARKVVVTKDETTIVEGSGDSDAIAGRVAQIRAEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVREGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     08/705,347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     160:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11000.1002c3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ω
··
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                    361
                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
```

2

δÃ

361

KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420

241

18 į

301

300

361 360

```
Ъ
                               Qγ
                                                               DЬ
                                                                                           Qy
                                                                                                                               Dр
                                                                                                                                                               Qy
                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; MOLECULE TYPE: protein PCT-US94-06362-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 4
PCT-US94-06362-4
                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 4, Application GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPUTED:
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE/DOCKET NUMBER: WHI88-08AFA2 PCT TELECOMMUNICATION INFORMATION: TELEPHONE: (617) 861-6240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08
FILING DATE: 04-JUN-1993
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
LENGTH: 540 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NUMBER OF SEQUENCES:
 302
                               301
                                                                                                                              182 GLQLELTEGMREDKGYISGYEVTDPERQEAVLEDPYILLVSSKYSTYKDLLPLLEKYIGA
                                                                                                                                                                  181
                                                                                                                                                                                                   122
                                                                                               241 GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNI
                                                                                                                                                                                                                  121 AADAVFEALLASATPVSGKTGTAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                  61 EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: FILING DATE: 06-JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET: 2 Milit.
CITY: Lexington
STATE: MA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE: Hamilton, Bro
STREET: 2 Militia Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME: Granahan, Patricia
                                                                                                                                                                                                                                                                                                                                                 2 AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
EVGLTLENADLSLLGKARKVVVTKDETTIVEGAGDTDAIAGRVAQIRQEIENSDSDYDF:
               GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT 240
                                                                                                                                                                                                 AVEKVTETLLKGAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                                                 EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALRKEGLRNVAAGANPLGLKRGIEK 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            02173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         06-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                 59.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PC/TUS9406362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Stress
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PCT/US94/06362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Brook,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   32,227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        08/073,381
                                                                                                                                                                                                                                                                                                                                                                                               73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Proteins
                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1571.5; DB Pred. No. 1e-131;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Smith & Reynolds,
                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Uses
                                                                                                                                                                                                                                                                                                                                                                                                 127;
                                                                                                                                                                                                                                                                                                                                                                                                                                DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Therefor
                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                  540;
                                                                                                                                                                                                                                                                                                                                                                                               ω
--
```

Gaps

۲,

60

```
В
                                                                                         Ş
                                                                                                                          DЬ
                           Š
                                                                                                                                                       2
 B
                                                                                                                                                                                                                                                                      US-08-997-080-114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 5
US-08-997-080-114
                                                                                                                                                                                                        Query Match
Best Local :
                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 114, Application US/08997080 Patent No. 5968524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATTORNEY/AGENT INFORMATION: NAME: Sleath, Janet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: FastSEQ for Windows Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: WATSON, JAMES D. APPLICANT: TAN, PAUL L.J.
                                                                                                                                                                                                                                                                                    MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                TELECOMMUNICATION INFORMATION: TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: METHODS AND COMPOUNDS FOR THE TREATMENT OF IMMUNOLOGICALLY-
 122
                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          362 KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                              62
                                                                                           61
                                                                                                                                                                                          Local Sines 321;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER: IBM COMPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STREET: 2001 -
                                                                                                                                                                                                                                                                                                     TOPOLOGY:
                                                                                                                                                                                                                                                                                                               STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                 TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NAME: Sleath, Janet REGISTRATION NUMBER: 37,007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US/08/997,080 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY:
                                                                                                                            N
                                                                                                                                                                                                                                                                                                                                                LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
              AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                          TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APTLDELK---LEGDEATGANIVKVALEAPLKQIAFNSGLEPGVVAEKVRNLPAGHGLNAQ 478
AVEAVTQSLLKSAKEVETKEQISATAAISAGDTQIGELIAEAMDKVGNEGVITVEESNTF 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TGVYEDLLAAGVADPVKVTRSALQNAASIAGLFLTTEAVVADKPEK 524
                                                                                                                                                                                        h 59.0%; Score 1566.5; DB 2; Similarity 61.3%; Pred. No. 2.8e-131; 21; Conservative 79; Mismatches 121;
                                                                                                                                                                                                                                                                                                                                   amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2601 Elliott Avenue,
                                                                                                                                                                                                                                                                                                                                                   523 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               USA
                                                                                                                                                                                                                                                                                                                                                                                                                 206-269-0563
                                                                                                                                                                                                                                                                                                    linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Law Offices of Ann W. Speckman
                                                                                                                                                                                                                                                                                                                 single
                                                                                                                                                                                                                                                                                                                                                                                  114:
                                                                                                                                                                                                                                                                                                                                                                                                                                                               11000.1007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Suite 4185
                                                                                                                                                                                        Indels
                                                                                                                                                                                                                     Length 523;
                                                                                                                                                                                        ω
                                                                                                                                                                                      Gaps
                                                                                                                                                                                        2
```

```
US-08-997-362-114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 114, Application US/08997362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL
                                                 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                               APPLICATION NUMBER: U.S. Patc
FILING DATE: June 12, 1997
APPLICATION NUMBER: U.S. Patc
FILING DATE: August 29, 1996
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SHAPESS:
CORRESPONDENCE ADDRESS:
ADDRESSEE: Law Offices of Ann W. Speckman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Skinner, Margot
APPLICANT: Scott, Linda
APPLICANT: Prestidge, Ross
TITLE OF INVENTION: COMPOUNDS AND METHODS FOR THE OF INVENTION: TREATMENT AND DIAGNOSIS
                             SEQUENCE CHARACTERISTICS:
                                                                                                  TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                     CLASSIFICATION: PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                         SOFTWARE: FastSEQ for Windows Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241 GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182 GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEDPYILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181 GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT | :|| |||: | ||:: | |||||||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        302 RVGLSLETADVSLLGQARKVVVTKDETTIVEGSGDSDAIAGRVAQIRAEIENSDSDYDRE 361
                                                                TELEX:
                                                                                TELEFAX:
                                                                                                TELEPHONE:
                                                                                                                                   REGISTRATION NUMBER: 37 REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                         FILING DATE:
                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                        OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                          MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE: Law CALL AVENUE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                           COUNTRY:
              LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APALDDL--GLTGDEATGANIVRVALSAPLKQIAFNGGLEPGVVAEKVSNLPAGHGLNAA 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALL-QS 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RKALTELRASLIGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                              98121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5985287
                                                                                                                                                                 Sleath,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WA
523 amino acids
nino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                  206-269-0563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hiyama, Jun
Visser, Elizabeth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tan, Paul
                                                                                                                                                                                                                                                                                                                                                                                        IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                           Diskette
                                                                                                                                                                  Janet
                                                                                                                                                                                                                                                                                                                                                                          DOS
                                                                                                                                                                                                                                     U.S. Patent Application No.
2, 1997
                                                                                                                                                                                                                                                                                                                         us/08/997,362
                                                                                                                                                 37,007
                                                                                                                                   11000.1002c2
                                                                                                                                                                                                                   Patent Application
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FOR
IS OF MYCOBACTERIAL INFECTIONS
                                                                                                                                                                                                                       No.
                                                                                                                                                                                                                                                       5985287 08/873,970
```

ľ

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; STRANDEDNESS:
; TOPOLOGY: lii
; MOLECULE TYPE:
US-08-997-362-114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 7
US-09-095-855-114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 114, Application US/09095855 Patent No. 6160093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
COMPUTER READABLE FORM:
MEDIJUM TYPE: Diskette
COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
SOFTWARE: FastSEQ for Windows Version
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/095,855
                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: Compounds and Methods for TITLE OF INVENTION: Treatment and Diagnosis of NUMBER OF SEQUENCES: 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Tan, Paul
APPLICANT: Visser, Elizabeth
APPLICANT: Skinner, Margot
APPLICANT: Prestidge, Ross
                                                                                                                                                                                                                                                                  STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
STREET: 20
                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301 DAGIYLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                COUNTRY: UZIP: 98121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     / Match 59.0%; Score 1566.5; DB 2; Local Similarity 61.3%; Pred. No. 2.8e-131; nes 321; Conservative 79; Mismatches 121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APALDDL--GLTGDEATGANIVRVALSAPLKQIAFNGGLEPGVVAEKVSNLPAGHGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEBGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AVEAVTQSLLKSAKEVETKEQISATAAISAGDTQIGELIAEAMDKVGNEGVITVEESNTF 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGEYEDLLKAGVADPVKVTRSALQNAASIAALFLTTEAVVADKP 522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RVGLSLETADVSLLGQARKVVVTKDETTIVEGSGDSDAIAGRVAQIRAEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVVSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALL-QS
                                                                                                                                                                                                                                                                                                                             E: Law Offices of Ann W.
2601 Elliott Avenue, Sui
                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     single
                                                                                                                                                                                                                                                                                                                                 n W. Speckman
Suite 4185
                                                              2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterial Infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      523;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2;
```

```
Q
                                                밁
                                                                       Q
                                                                                                                      20
                                                                                                                                               В
                                                                                                                                                                      Ş
                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                               Вþ
                                                                                                                                                                                               Db
                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-095-855-114
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 59.0%;
Best Local Similarity 61.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILING DATE: 23-DEC-1997
ATTORNEY/AGENT INFORMATION:
NAME: Sleath, Janet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY: 1i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 523 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE: 206-269-0565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION DATA: APPLICATION NUMBER:
  479
                        481
                                                 421
                                                                                                362
                                                                                                            361 KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                302
                                                                                                                                                                                               242
                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                182
                                                                                                                                                                                                                                                                                           301 DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                           STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE/DOCKET NUMBER: 37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE: 29-AUG-1996
APPLICATION NUMBER: 08/873,970
FILING DATE: 12-JUN-1997
APPLICATION NUMBER: 08/997,362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                              N
                                                                                                                                                                                                                                                                                                                                                                                                        TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP 524
TGEYEDLLKAGVADPVKVTRSALQNAASIAALFLTTEAVVADKP
                                                                                                                                              GKPLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGGQVVSE
                                                                                                                                                                                                           GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                APALDDL--GLTGDEATGANIVRVALSAPLKQIAFNGGLEPGVVAEKVSNLPAGHGLNAA
                                                                       RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVALL-QS
                                                                                                                                                                                                                                                                                                                                                                                            AKTIAYDEEARRGLERGLNALADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 523 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     206-269-0563
                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 08/705,347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                37,007
                                                                                                                                                                                                                                                                                                                                                                                                                                         79; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1566.5; DB 3; Pred. No. 2.8e-131;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       11000.1002c3
                                                                                                                                                                                                                                                                                                                                                                                                                                             121;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 523;
                                                                                                                                                                                                                                                                                                                                                                                                                                            ω
``
                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                478
                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                      180
                                                                                                42C
                                                                                                                                                                       360
                                                                                                                                                                                               301
                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                     24 C
                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                               361
```

2

RESULT 8 US-08-467-822-34

Sequence 34, Application US/08467822 Patent No. 5843460 GENERAL INFORMATION:

```
οy
                                                                                                                       В
                                                                                                                                                        δÃ
                                                                                                                                                                                            В
                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                              δÃ
                  Ş
                                                    В
                                                                                                                                                                                                                                                                                                                                Query Match 58.3
Best Local Similarity 60.1
Matches 316; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                     MOLECULE TYPE: 08-467-822-34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION FOR SEQ ID NO: 34: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Ferrero, APPLICANT: Thiberge, TITLE OF INVENTION: TITLE OF INVENTION: TITLE OF INVENTION: TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REGISTRATION NUMBER: 25,146
REFERENCE/DOCKET NUMBER: 03
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION DATA:
APPLICATION NUMBER: (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
                   241
                                                                                                                         122
                                                                                                                                           121 AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                              62
                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: US 08/447,177 FILING DATE: 19-MAY-1995 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                       TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: US/0 FILING DATE: 06-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                 N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADDRESSEE:
GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP 300
                                                                                     GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT 240
                                                                                                                                                                                                                EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                           GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEEPYILLVSSKVSTVKDLLPLLEKVIQA 241
                                                                                                                       AVDKVTETLLKDAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF 181
                                                                                                                                                                                            EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVKEGLRNVAAGANPLGLKRGIEK 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20005-3315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Meyers, Kenneth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1300 I Street, N.W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Thiberge, Jean-Michel

VENTION: IMMUNOGENIC COMPOSITIONS AGAINST

VENTION: HELICOBACTER INFECTION, POLYPEPTIDES FOR USE IN THE

VENTION: COMPOSITIONS, AND NUCLEIC ACID SEQUENCES ENCODING SAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (202)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sauerbaum, Sebast
Ferrero, Richard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Labigne, Agnes
                                                                                                                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Dunner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Finnegan, Henderson, Farabow, Garrett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (202) 408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                     protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     02-MAY-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             408-4400
                                                                                                                                                                                                                                                                                                                                                  58.2%; Score 1543.5; DB 2 60.1%; Pred. No. 3.3e-129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/08/467,822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US 08/432,697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sebastien
                                                                                                                                                                                                                                                                                                                                    77;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 03495.0137-02000
                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Version #1.30
                                                                                                                                                                                                                                                                                                                                                                  DB 2;
                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                  Length 541;
                                                                                                                                                                                                                                                                                                                                  ω
                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                    2
```

```
DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Dр
US-08-447-154-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-08-447-154-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 19,
                                                                            INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS LENGTH: 541 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: APPLICANT:
                                                                                                                                          REGISTRATION NUMBER: 36,848
REFERENCE/DOCKET NUMBER: 60
TELECOMMUNICATION INFORMATION:
TELEPHONE: 612-332-5300
                                                                                                                                                                                                                                                                                        CLASSIFICATION: 514
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                       SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
               MOLECULE TYPE:
                                                                                                                                                                                                                          ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302 EVGLTLENTDLSLLGKARKVVMTKDETTIVEGAGDTDAIAGRVAQIRTEIENSDSDYDRE 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  242 GKSLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGAQVISE
                              STRANDEDNESS:
TOPOLOGY: li
                                                                                                                                                                                                                                            CLASSIFICATION:
                                                                                                                                                                                                                                                          APPLICATION NUMBER: US 0 FILING DATE: 16-DEC-1994
                                                                                                                                                                                                                                                                                                                          FILING DATE:
                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                         OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ZIP:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: Minneapolis STATE: Minnesota
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STREET:
                                                                                                                              TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APALDKLK---LTGDEATGANIVKVALEAPLKQIAFNSGMEPGVVAEKVRNLSVGHGLNAA 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGEYEDLLKAGVADPVKVTRSALQNAASIAGLFLTTEAVVADKPEK 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                            55402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5958416
                                                              amino acid
                                                                                                                                                                                                         Kowalchyk, Katherine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Application US/08447154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E: Merchant & Gould
3100 No. 5958416west Center
                                                                            541 amino acids
                                                                                                                              612-332-9081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Braun, Peter E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Kotilinek, Linda K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Birnbaum,
                                                                                                                                                                                                                                                                                                                                                                                         IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
                              linear
                                                                                                                                                                                                                                                                                                                          23-MAY-1995
             protein
                                             single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Disease
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       System
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequences with Cyclic Nucleotide Phosphodiesterase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Share
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Heat Shock Protein Peptides That
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Methods for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gary
                                                                                                                                                                                                                                                                           US 08/368,834
                                                                                                                                                                                                                                                                                                                                         US/08/447,154
                                                                                                                                                                              600.309US01
                                                                                                                                                                                                              X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Modulating Autoimmune
                                                                                                                                                                                                                                                                                                                                                                           Version
                                                                                                                                                                                                                                                                                                                                                                             #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Central Nervous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
```

Length 540; Indels

4. Gaps

ω

60

61

```
망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 10
US-08-368-834-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ϋ́
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Patent No. 5874405
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 20,
                                                                                                                                                                                                                                                                                                                    TITLE OF INVENTION: 1
TITLE OF INVENTION: 1
TITLE OF INVENTION: 1
TITLE OF INVENTION: 1
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: APPLICANT:
                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                               ATTORNEY/AGENT INFORMATION: NAME: Kowalchyk, Katheri
                                                                                                                                                                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                        STREET:
CITY: N
                                                               FILING DATE: 10 CLASSIFICATION:
                                                                            APPLICATION NUMBER: US/08/368,834 FILING DATE: 16-DEC-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity hes 316; Conserv
                NAME: Kowalchyk, Katherine M. REGISTRATION NUMBER: 36,848
                                                                                                                                                                                                             ZIP: 55402
                                                                                                                                                                                                                          COUNTRY:
 REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                        ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKPLLIVAEDVEGEALATLYVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APALDKLK--LTGDEATGANIVKVALEAPLKQIAFNSGMEPGVVAEKVRNLSVGHGLNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EVGLTLENTDLSLLGKARKVVMTKDETTIVEGAGDTDAIAGRVAQIRTEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GKSLLIIAEDVEGEALSTLYVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGAQVISE 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EDPYEKIGAELVKEVAKKTDDYAGDGTTTATVLAQALVKEGLRNVAAGANPLGLKRGIEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                                                                                                                                                                                                                          Minneapolis
                                                                                                                                                                                                                                         Minnesota
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Application US/08368834
                                                                                                                                                                                                                                                                       E: Merchant & Gould
3100 No. 5874405west Center
                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                  Birnbaum, Gary
Kotilinek, Linda K.
Braun, Peter E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                      Disease
                                                                                                                                                                                                                                                                                                                                                                    Heat Shock Protein Peptides That Share
Sequences with Cyclic Nucleotide Phosphodiesterase and
                                                                                                                                                                                                                                                                                                                                                     Methods for Modulating Autoimmune Central Nervous System
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60.1%;
                                                                                                                                                                                                                                                                                                                       20
               36,848
 600.303US01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pred. No. 3.3e-129;
7; Mismatches 130;
                                                                                                                             Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                     RESULT 11
PCT-US94-06362-3
                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-08-368-834-20
                                                                                                                                                                                                                                       Sequence 3, Application PC/TUS9406362 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELECOMMUNICATION INFORMATION:
TELEPHONE: 612-332-9500
TELEPAX: 612-332-9081
INFORMATION FOR SEQ ID NO: 20:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: amino ac
STRANDEDNESS:
TOPOLOGY: line
MOLECULE TYPE: ]
                                              COMPUTER READABLE FORM:
                                                                                                                                                         TITLE OF INVENTION: St
NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                        478
                                                                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                             STATE: MA
COUNTRY: US
ZIP: 02173
                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                         STREET: 2 Milit CITY: Lexington
COMPUTER: IBM PC OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH: 540 amino acid
                               MEDIUM TYPE:
                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AKTIAYDEEARRGLERGLNSLADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                    TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKSLLIIAEDVEGEALSTLVVNKIRGTFKSVAVKAPGFGDRRKAMLQDMAILTGAQVISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                     TGEYEDLLKAGVADPVKVTRSALQNAASTAGLFLTTEAVVADKPEK
                                                                                                                                                                                                                                                                                                                                                                                                  APALDKLK--LTGDEATGANIVKVALEAPLKQIAFNSGMEPGVVAEKVRNLSVGHGLNAA 477
                                                                                                                                                                                                                                                                                                                                                                                                                                  RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVGLTLENTDLSLLGKARKVVMTKDETTIVEGAGDTDAIAGRVAQIRTEIENSDSDYDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GLQLELTEGMRFDKGYISGYFVTDAERQEAVLEEPYILLVSSKVSTVKDLLPLLEKVIQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVKEGLRNVAAGANPLGLKRGIEK
                                                                                                                             2 Militia Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 540 amino acids
                                                                              USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   linear
                                                                                                                                             Hamilton,
                               Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     57.8%; Score 1535; DB 2; 60.1%; Pred. No. 1.9e-128;
compatible
PC-DOS/MS-DOS
                                                                                                                                                                                         Stress Proteins
                                                                                                                                          Brook,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   77; Mismatches 129;
                                                                                                                                             Smith
                                                                                                                                            & Reynolds,
                                                                                                                                                                                          and Uses Therefor
```

360

360

300

300

419

240

180

```
Qy
                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                            US-08-467-822-32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                           Sequence 32, Application US/08467822 Patent No. 5843460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INFORMATION FOR SEQ ID NO:
APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FILING DATE: 04-JUN-1993
ATTORNEY/AGENT INFORMATION:
NAME: Granahan, Patricia
REGISTRATION NUMBER: 32,
                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELECOMMUNICATION INFORMATION: TELEPHONE: (617) 861-6240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: PatentIn Release #1.0, Version CURRENT APPLICATION DATA:
                                                                                                                                                                        479 TGEYEDLLKAGVADPVKVTRSALQNAASIAGL-FTTEAVVADKPEK 523
                                                                                                                                                                                                        481
                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                              302
                                                                                                                                                                                                                                                                                                                                                                                                                           242
                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         182
                                                                                                                                                                                                                                                                                                 362 KLQERLAKLAGGVAVIKAGAATEVELKERKHRIEDAVRNAKAAVEEGIVAGGGVTLL-QA
                                                                                                                                                                                                                                                                                                                                                                                          301 DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REGISTRATION NUMBER: 32,227
REFERENCE/DOCKET NUMBER: WHI88-08AFA2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: FILING DATE: 06-JU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                                                                                                                                                  KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                      TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                       APALDKLK--LTGDEATGANIVKVALEAPLKQIAFNSGMEPGVVAEKVRNLSVGHGLNAA
                                                                                                                                                                                                                                                       RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                            EDPFEDLGAQLVKSVATKINDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AVDKVTETLLKDAKEVETKEQIAATAAISAGDQSIGDLIAEAMDKVGNEGVITVEESNTF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EDPYEKIGAELVKEVAKKTDDVAGDGTTTATVLAQALVKEGLRNVAAGANPLGLKRGIEK 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AKTIAYDEEARRGLERGLNSLADAVKVTLGPKGRNVVLEKKWGAPTITNDGVSIAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 amino acid
)GY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           540 amino acids
Thiberge, Jean-Michel
            Sauerbaum, Sebast
Ferrero, Richard
                                           Labigne,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     06-JUN-1994
                                             Agnes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     57.6%; Score 1530; DB 4; 59.9%; Pred. No. 5.2e-128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US 08/073,381
                                Sebastien
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PCT/US94/06362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      77;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω
```

```
δõ
                                                                                                                 B
                                                                                                                                                Ş
                                                                                                                                                                                  DЬ
                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                             20
                                                  밁
                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-467-822-32
                                                                                                                                                                                                                                                                                                                                                                                               Best
                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEFAX: (202) 408-4400 INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME: Meyers, Kenneth J.
REGISTRATION NUMBER: 25,146
REFERENCE/DOCKET NUMBER: 03495.0137-02000
TELECOMMUNICATION INFORMATION:
TELEPHONE: (202) 408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE: 19-MAY-1995
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/432,697
FILING DATE: 02-MAY-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILING DATE: 06-JUN-
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                  300
                                                  243
                                                                                                                 183
                                                                                                                                                 180
                                                                                                                                                                                  123
                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ZIP:
                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                              49.2%; Score 1305.5; DB 2;
Local Similarity 52.6%; Pred. No. 5.1e-108;
nes 276; Conservative 90; Mismatches 156;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREET: 1300 I S CITY: Washington STATE: D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADDRESSEE: Finnegan, Henderson,
                                                                                                                                                                                                                                                                                                                 ω
                                                                                                                                                                                                                                                                                                                                               1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
AADAVFEALLASATPVSGKTGIAQVATVSSR-DEQIGDLVGEAMNKVGHDSVVSVKESST 179
                                                                                                                                                                                                                                               AGKPLLITAEDVEGEALATAVVNTTRGIVKVAAVKAPGFGDRRKAMLQDIATLTGGTVIS
                                                                               TGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVN 299
                                                                                                                                                LGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG
                                                                                                                                                                                  AVTAAVEELKALSVPCSDSKAIAQVGTISANSDETVGKLIAEAMDKVGKEGVITVEDGTG 182
                                                                                                                 LQDELDVVEGMQFDRGYLSPYFINKPETGAVELESPFILLADKKISNIREMLPVLEAVAK 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RY: USA
20005-3315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1300 I Street, N.W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            548 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bunner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            06-JUN-1995
ON: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IMMUNOGENIC COMPOSITIONS AGAINST HELICOBACTER INFECTION, POLYPEPTIDES FOR COMPOSITIONS, AND NUCLEIC ACID SEQUENCES POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US/08/467,822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          08/447,177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Farabow,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                              DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Garrett
                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                548;
                                                                                                                                                                                                                                                                                                                                                                                ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         USE IN THE
                                                                                                                                                                                                                                                                                                                                                                                Gaps
                  359
                                                  302
                                                                                                                                                   239
                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                ω
```

8

Вþ

В Qy 망

423 420 363 360 303

ARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNV 479

EKLQERVAKLAGGVAVIKVGAATEVEMKEKKARVEDALHATRAAVEEGVVAGGGVALIRV EKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQ 419 EEIGMELEKATLEDLGQAKRVVINKDTTTIIDGVGEEAAIQGRVAQIRQQIEEATSDYDR

422

ASK-LADLRGQ-NEDQNVGIKVALRAMEAPERQIVLNCGEEPSVVANTVKGGDGNYGYNA

ω ••

```
; TOPOLOGY: 1:
; MOLECULE TYPE:
US-08-467-822-31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 13
US-08-467-822-31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 31, Approximate No. 5843460
Query Match
Best Local Similarity
                                                                                                                                                                                          TELEFAX: (202) 408-4400 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0
                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                           NAME: Meyers, Kenneth J.
REGISTRATION NUMBER: 25,146
REFERENCE/DOCKET NUMBER: 034
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 0:
FILING DATE: 19-MAY-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION DATA: APPLICATION NUMBER: US
                                                                                                                                                                                                                                                                                                  ATTORNEY/AGENT INFORMATION: NAME: Meyers, Kenneth J.
                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/432,697
FILING DATE: 02-MAY-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE: Finnegan, Henderson,
ADDRESSEE: Dunner
STREET: 1300 I Street, N.W.
CITY: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE: 06 CLASSIFICATION:
                                                                                                                    STRANDEDNESS:
                                                                                                                                        TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION:
                                                                                                                                                                                                                           TELEPHONE:
                                                                                                                                                      LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATEEYGNMIDMGILDPTKVTRSALQYAASVAGLMITTECMVTDLP 525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RY: USA
20005-3315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Application US/08467822
                                                                                                                                                        548 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Thiberge, Jean-Michel
VERWION: IMMUNOGENIC COMPOSITIONS AGAINST
VERWION: HELICOBACTER INFECTION, POLYPEPTIDES FOR USE IN THE VERWION: COMPOSITIONS, AND NUCLEIC ACID SEQUENCES ENCODING VERMION: POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sauerbaum, Sebastie
Ferrero, Richard L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Labigne, Agnes
Sauerbaum, Sebastien
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PatentIn Release #1.0, Version
                                                                                                   ss: single
linear
                                                                                                                                                                                                                           (202) 408-4000
                                                                                     protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            06-JUN-1995
 4.8
50
                                                                                                                                                                                                                                                                                                                                                                                                                                      US 08/447,177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US/08/467,822
. 98;
                                                                                                                                                                                                                                                               03495.0137-02000
Score
Pred.
1295.5; DB 2
No. 3.9e-107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Farabow, Garrett &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               #1.30
                2;
              Length 548;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NG SAID
```

```
Q
                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                             οy
                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
     B
                                                                        Вþ
                                                                                                        QΥ
                                                                                                                                              밁
                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                        Вр
                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
   480
                                     480
                                                                        421
                                                                                                            420
                                                                                                                                                362
                                                                                                                                                                                 360
                                                                                                                                                                                                                     302
                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                          242
                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                    NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAE
ATGEYGDMVEMGILDPTKVTRMALQNAASVASLMLTTECMVADLPKKEE
                                                                                                        ARKALTELRASLTGDEVLGVDVFSEALAAPLFWTAANAGLDGSVVVNKVSELPAGHGLNV
                                                                                                                                              EKLQERVAKLAGGVAVIKVGAATEVEMKEKKARVEDALHATRAAVEEGIVAGGGVALI-R
                                                                                                                                                                EKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQ
                                                                                                                                                                                                                 EEIGKSLEGATLEDLGSAKRIVVTKENTTIIDGEGKATEINARIAQIRAQMEETTSDYDR
                                                                                                                                                                                                                                               PDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDR
                                                                                                                                                                                                                                                                                                                          TGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVN
                                                                                                                                                                                                                                                                                                                                                            LENELYVVEGMQFDRGYISPYFINNQQNMSCELEHPFILLVDKKVSSIREMLSVLEGVAK
                                                                                                                                                                                                                                                                                                                                                                                  LGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EDPFEDLGAQLVKSVATKINDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                        AQKALDSLKGD-NDDQNMGINILRRAIESPMRQIVTNAGYEASVVVNKVAEHKDNYGFNA
                                                                                                                                                                                                                                                                                      SGRPLLIIAEDIEGEALATLVVNNMRGIVKVCAVKAPGFGDRRKAMLQDIAILTKGQVIS
                                                                                                                                                                                                                                                                                                                                                                                                                                   AVLAVTKKLQAMSKPCKDSKATAQVGTISANSDEAIGAITAEAMEKVGKEGVITVEDGNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AADAVFEALLASATPVSGKTGIAQVATVSSR-DEQIGDLVGEAMNKVGHDSVVSVKESST 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EHRFMNMGAQMVKEVASKTSDTAGDGTTTATVLARSILVEGHKAVAAGMNPMDLKRGIDK 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AKELRFGDDARLQMLAGVNALADAVQVTMGPRGRNVVLEKSYGAPTVTKDGVSVAKE1EF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      269; Conservative 105; Mismatches 152;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                            479
                                                                                                                                              420
                                                                                                                                                                               419
                                                                                                                                                                                                                                                                                                                            299
                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                        479
                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                      359
                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                             241
```

```
RESULT 14
US-08-470-260-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 6, Patent No. (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM CCOMpatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Rappuoli, TITLE OF INVENTION: I
                 FILING DATE: 21-OCT-1994 ATTORNEY/AGENT INFORMATION:
                                                PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQUENCES: 7
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                 STREET: 4560 Horto
CITY: Emeryville
STATE: California
                                                                                  FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                  APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                     ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         , Application US/08470260 6077706
                                                                                                                                                                                                                                     94608-2916
McClung,
                                                                                                                                                                                                                                                                                                     4560 Horton
                                                                                                                                                                                                                                                     USA
                                                                                                                                                                                                                                                                                                                                                                                                                    Telford, John
Macchia, Giovanni
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bugnoli, Massimo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Covacci,
                                                                                                                                                                                                                                                                                                                     Chiron Corporation
                                                                                                                                                                                                                                                                                                                                                                    Helicobacter Pylori Proteins Useful for Vaccines and Diagnostics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Antonello
                                                                                                                                                                                                                                                                                                                                                                                                     Rino
                                                   us 08/256,848
                                                                                                                  US/08/470,260
                                                                                                                                                  #1.25
```

ω

```
Вρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                           APPLICANT: Covacci, Antonello
APPLICANT: Bugnoli, Massimo
APPLICANT: Telford, John
APPLICANT: Telford, Giovanni
APPLICANT: Macchia, Giovanni
APPLICANT: Rappuoli, Rino
TITLE OF INVENTION: Helicobacter Pylori Prote
TITLE OF INVENTION: Diagnostics
FILE REFERENCE: CHIR004
CURRENT APPLICATION NUMBER: US/08/471,491B
CURRENT FILING DATE: 1995-06-06
                                                                                                                                                                                                                                                                          US-08-471-491-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-08-470-260-6
                                                                                                                                                                                                                Sequence 6, Application US/08471491B Patent No. 6090611
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 265;
SOFTWARE:
                  NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELECOMMUNICATION INFORMATION: TELEPHONE: (510) 651-2708
TELEFAX: (510) 655-3542
INFORMATION FOR SEQ ID NO: 6:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
LENGTH: 546 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                             478 SNGKYVDMFKEGIIDPLKVERIALQNAVSVSSLLLTTEATVHEIKEEKA 526
                                                                                                                                                                                                                                                                                                                                                                               480 NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVD-KPAKA 527
                                                                                                                                                                                                                                                                                                                                                                                                                    422
                                                                                                                                                                                                                                                                                                                                                                                                                                     302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180 LGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122 AAEAIINELKKASKKVGGKEEITQVATISANSDHNIGKLIADAMEKVGKDGVITVEEAKG 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 AADAVFEALLASATPVSGKTGIAQVATVSSR-DEQIGDLVGEAMNKVGHDSVVSVKESST 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62 SCPVANMGAQLVKEVASKTADAAGDGTTTATVLAYSIFKEGLRNITAGANPIEVKRGMDK 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: amino acid
STRANDEDNESS: sir
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REGISTRATION NUMBER: 33, REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDR 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                  AQK----VHLNLHDDEKVGYEIIMRAIKAPLAQIAINAGYDGGVVVNEVEKHEGHFGFNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IEDELDVVEGMQFDRGYLSPYFVTNAEKMTAQLDNAYILLTDKKISSMKDILPLLEKTMK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AKEIKFSDSARNLLFEGVRQLHDAVKVTMGPRGRNVLIQKSYGAPSITKDGVSVAKEIEL
PatentIn Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            48.6%; Score 1289; DB 3; ilarity 50.1%; Pred. No. 1.5e-106; Conservative 105; Mismatches 153;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 33,113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0316.001
                                                                                                        Pylori Proteins Useful For Vaccines
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 546;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                          And
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ω
••
```

```
; SEQ ID NO 6;
; LENCTH: 546;
; TYPE: PRT;
; ORGANISM: Helicobacter pylori
US-08-471-491-6
                                                                            Qy
                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                             Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 265; Conserv
                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        422
                                                                                                                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61 EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVD-KPAKA
: | | : ||:||:|| | |: || ||: ::|||| | | | ||
SNGKYVDMFKEGIIDPLKVERIALQNAVSVSSLLLTTEATVHEIKEEKA
                                                                                                                                                                                                            ARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNV 479
                                                                                                                                                                                                                                                                                                                                                                          EKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQ 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PDAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDR 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EGKPLLIAEDIEGEALTTLVVNKLRGVLNIAAVKAPGFGDRRKEMLKDIAILTGGOVIS 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGKPLLIVAEDVEGEALATLYVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVN 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          : ||: ||: |:|| |||| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|| ||:|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SCPVANMGAQLVKEVASKTADAAGDGTTTATVLAYSIFKEGLRNITAGANPIEVKRGMDK 121
                                                                                                                                                                  AQK----VHLNLHDDEKVGYEIIMRAIKAPLAQIAINAGYDGGVVVNEVEKHEGHFGFNA
                                                                                                                                                                                                                                                                                                                                    EKLQERLAKLSGGVAVIKVGAASEVEMKEKKDRVDDALSATKAAVEEGIVIGGGAALIRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EELGLSLENAEVEFLGKAGRIVIDKDNTTIVDGKGHSDDVKDRVAQIKTQIASTTSDYDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AKEIKFSDSARNLLFEGVRQLHDAVKVTMGPRGRNVLIQKSYGAPSITKDGVSVAKEIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative 105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    48.6%; Score 1289; DB 3; 50.1%; Pred. No. 1.5e-106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
        526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
```

Search completed: January 5, 2001, 14:27:16 Job time: 208 sec

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            otal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     seq
A_Geneseq_36:*

| SIDSI/gcgdata/geneseq/geneseqp/AA1980.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1981.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1982.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1983.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1983.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1984.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1989.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1989.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1989.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1990.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1991.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1993.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1993.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1993.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1993.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1995.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1995.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1995.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1997.DAT:*
| SIDSI/gcgdata/geneseq/geneseqp/AA1999.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        268485 seqs, 34193795 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-461-774-2
2654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      January 5, 2001, 14:23:23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SKLIEYDETARRAMEVGMDK......VVVDKPAKAEDHDHHHGHAH 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Search time 62.98 Seconds (without alignments) 292.097 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    268485
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Amino acid sequenc	14071	2	223	29.0	100.0	1.2
	41 1001	2	נים	n 0	1566 5	ני
M. vaccae antiqen	W60144	19	523	59.0	1566.5	11
Mycobacteria sp. h	MSZIOO	Τα	040	09.5	13/2.3	10
poduction of history		,	1 (1 0	1 (
Seguence of Mycoba	P80215	9	560	59.3	1574.5	9
Amino acid sequenc	Y14909	20	541	59.3	1574.5	8
Amino acid sequenc	Y23911	20	540	59.3	1574.5	7
Mycobacterium tube	W44702	19	540	59.3	1574.5	6
Mycobacterium tube	R81610	16	540	59.3	1574.5	_U
Sequence of Mycoba	P81351	9	540	59.3	1574.5	4
GroEL-1 protein.	R22363	13	540	61.9	1643.5	ω
Amino acid sequenc	Y23912	20	537	83.8	2223	2
Amino acid sequenc	Y23914	20	539	97.8	2596	1
COCH PC CHOC		1				: : :
	Ħ	DB.	Length	Query	SCOTE	Result

45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	ω	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
1289	1289	1299.5	1299.5	1300.5	1301.5	1305.5	1306.5	1307.5	1307.5	1314.5	1316.5	1318	1351	1355.5	1369	1375.5	1393	1398.5	1399	1427.5	1503	1507	1520.5	1525	1540.5						1554.5	555.
48.6	œ •	9	9.	9		٠	9	•		٠	•							2													58.6	ω.
546	546	548	545	549	544	548	544	548	548	545	544	539	440	548	552	541	541	544	539	545	573	573	548	539	541	588	541	541	573	572	544	545
14	14	16	20	20	20	19	12	20	19	20	21	20	13	18	20	20	20	20	20	20	16	1	17	20	20	9	20	16	16	11	18	20
R41200	R41661	R67382	Y23901	Y23909	Y23903	W61378	R13337	W95001	W65070	Y23915	Y75747	Y23916	R22362	W16678	Y23918	Y23902	Y23917	Y23905	Y23906	Y23904	R64765	R04715	R94368	Y23919	Y23913	P80364	Y23910	R67384	R64766	R04716	W32099) Y23930
p. Helicobac	. pylori hsp		Streptococcus pneu	\circ	Streptococcus pyoq	N-termina		9902989 Seq ID	E. coli GroEL prot	α	Neisseria meningit	Amino acid sequenc		Lawsonia intracell	Amino acid sequenc		acid	acid	Amino acid sequenc	н	orae	Amino acid sequenc	oacter	acid	nino aci	M. leprae 65kD ant	Amino acid sequenc	_	M. tuberculosis 65	Amino acid sequenc	Mycobacteria sp. h	Consensus mino aci

ALIGNMENTS

RESULT Y23914

Y23914 standard; Protein; 539 A

Y23914;

22-SEP-1999 (first entry)

Amino acid sequence of a heat shock protein.

Heat shock protein; Hsp; immune response; immunological carrier; cancer control; tumour; sarcoma; cancer; gene therapy.

Mycobacterium tuberculosis

W09935270-A1.

15-JUL-1999.

29-DEC-1998; 98WO-CA01203

31-DEC-1997; 97US-0001737

(STRE-) STRESSGEN BIOTECHNOLOGIES CORP.

Mizzen L, Wisniewski J;

WPI; 1999-430397/36

New nucleic acid encoding heat shock protein-60 from Streptococcus, useful in vaccines, as carriers for other immunogens, as anticancer agents and for diagnosis

Disclosure; Fig 10A-E; 176pp; English

```
RESULT
Y23912
ID Y2
XX
AC Y2
AC Y2
AC Y2
XX
EDT 22
XX
DE Am
XX
KW He
KW Ca
                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                        ° €
                                                                                                                                                                                             д
                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                          ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          r23905-30 represent heat shock proteins (Hsps). The specification describes Streptococcal Hsps, designated Hsp60. These proteins, their fragments, variants and fusion proteins, are used to elicit or enhance an immune response against Streptococcus, and to elicit a similar response to a target antigen fused to the protein. Unlike other immunological carriers, Hsp60 proteins are not immunosuppressive so provide an increased response to any conjugated or fused antigen. Also, where used for cancer control, they lack the side effects associated with endotoxins. They can also be used to detect specific antibodies and in treatment or prevention of tumours (e.g. sarcoma or cancers of bolynucleotide is used for recombinant production of the protein, as a source of primers and probes for detecting streptococci in standard therapeutically in gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                               Y23912
                  cancer
                            Heat shock protein; Hsp; immune response; immunological carrier;
                                                     Amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                        422
                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                             362
                                                                                                                                                                                                                                                                                                                                            302
                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                             242
                                                                                                                                                                                                                                                                                                                                                                                                                                             182
                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
                                                                                                                                                       N
                                                                                                                                                                                                                                                         RKALTELRASIFGDEVLGVDVESEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                         KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                         SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                          GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLFLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                            rkaltelrasltgdevlgvdvfsealaaplfwiaanagldgsvvvkkvselpaghglnvn
                                                                                                                                                                                                                                                                                         klgerlaklaggvavikvgaatetalkerkesvedavaaakaaveegivpgggaslihqa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          {\tt aadavseallasatpvsgktgiaqvatvssrdeqigdlvgeamskvghdgvvsveesstl}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sklieydetarramevgmdkladtvrvtlgprgrhvvlakafggptvtndgvtvareiel
                  control;
                                                                                                                               standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   vectors.
                                                     sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                  tumour;
                                                                                                                               Protein;
                                                     of a heat shock protein.
                                                                             entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97.8%;
                  sarcoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 2596; D
Pred. No. 3.2e
5; Mismatches
                cancer;
                gene therapy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2e-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
```

```
В
                                                                        Q
                                                                                                   В
                                                                                                                       δÃ
                         δÃ
                                                                                                                                                   В
                                                                                                                                                                          Qy
                                                                                                                                                                                                    Dр
                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                  뫄
                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                             Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                            response to a target antigen fused to the protein. Unlike other immunological carriers, Hsp60 proteins are not immunosuppressive so provide an increased response to any conjugated or fused antigen. Also where used for cancer control, they lack the side effects associated with endotoxins. They can also be used to detect specific antibodies and in treatment or prevention of tumours (e.g. sarcoma or cancers of breast, ovary, prostate, lung, pancreas or liver). The Hsp60 polynucleotide is used for recombinant production of the protein, as a source of primers and probes for detecting streptococci in standard hybridization/amplification assays, and therapeutically in gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Y23905-30 represent heat shock proteins (Hsp6). The specification describes Streptococcal Hsps, designated Hsp60. These proteins, their fragments, variants and fusion proteins, are used to elicit or enhance an immune response against Streptococcus, and to elicit a similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI;
                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New nucleic acid encoding heat shock protein-60 from Streptococcus, useful in vaccines, as carriers for other immunogens, as anticancer agents and for diagnosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mizzen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      29-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9935270-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                   therapy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (STRE-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                15-JUL-1999.
                            361
                                                                                                   242
                                                                                                                          241
                                                                                                                                                   182
                                                                                                                                                                                                    122
                                                                                                                                                                           181
                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                  N
                                                                                                                                                                                                                                                                                                             1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
edpfenlgaqlvksvatktndvagdgtttatvlaqalvkgglrmvaaganpvalgagisk
                                                                                                                                                                                                                                                            EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                 sklieydetarhamevgmnkladtvrvtlgprgrhvvlakafggptitndgvtvareidl
                                                                                                                                                                                                                                                                                                                                                  443;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1999-430397/36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ļ
                                                                                                                                                                                                                                                                                                                                                                                                                                    vectors.
                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRESSGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Wisniewski
                                                                                                                                                                                                                                                                                                                                                                                                             537 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fig 10A-E; 176pp; English
                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97US-0001737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98WO-CA01203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BIOTECHNOLOGIES
                                                                                                                                                                                                                                                                                                                                                          83.8%;
                                                                                                                                                                                                                                                                                                                                                 48;
                                                                                                                                                                                                                                                                                                                                                Score 2223; DB 20;
Pred. No. 1.5e-145;
8; Mismatches 45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for other immunogens, as anticancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORP
                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                        537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   enhance
                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                         360
                                                                                                   301
                                                                                                                          300
                                                                                                                                                   241
                                                                                                                                                                           240
                                                                                                                                                                                                    181
                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                          60
                                                  361
```

Ŋ

```
밁
                                          Q
                                                           В
                                                                         ρ
                                                                                            밁
                                                                                                                                                                        RESULT
R22363
         δÕ
                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                             Query Match
Best Local S
Matches 330
                                                                                                                                                                                      The amino acid sequence is that of is encoded by the groEL-1 gene, it shock protein. See also R22362 and
                                                                                                                                                                                                                                                                                     WPI;
                                                                                                                                                                       Sequence
                                                                                                                                                                                                                         Claim 18;
                                                                                                                                                                                                                                        Recombinant DNA contg. heat inducible promoter and heterologous gene - also vectors, transformed cells and new heat shock proteins of Streptococcus albus
                                                                                                                                                                                                                                                                                                                                                        03-SEP-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                          Кеу
                                                                                                                                                                                                                                                                                                                                                                                                                                          Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Heat shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GroEL-1 protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R22363;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R22363 standard;
                                                                                                                                                                                                                                                                                                    Mazodier P,
                                                                                                                                                                                                                                                                                                                      (INSP ) INST
                                                                                                                                                                                                                                                                                                                                       10-SEP-1990;
                                                                                                                                                                                                                                                                                                                                                                         19-MAR-1992
                                                                                                                                                                                                                                                                                                                                                                                        WO9204452-A
                                                                                                                                                                                                                                                                                                                                                                                                                  Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29-JUL-1992
                                                                                                                                                                                                                                                                            NSDB;
          181
                           122
                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                           62
                                                                            61
                                                                                             N
                                                                                                            1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ω
GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKV--A
                                                                                            1992-114358/14.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                           ddpyenlgaqlvkevatktndiagdgtttatvlagalvreglrnvaagaspaalkkgida
                                                                    EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                            Q22482.
                                                                                                                              330; Conservative
                                                                                                                                                                                                                       Fig 6; 50pp;
                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein;
                                                                                                                                                                                                                                                                                                    Guglielmi
                                                                                                                                                                                                                                                                                                                      PASTEUR.
                                                                                                                                                                                                                                                                                                                                                                                                                                          albus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first
                                                                                                                                                                        Ã,
                                                                                                                                                                                                                                                                                                                                       90FR-0011186
                                                                                                                                                                                                                                                                                                                                                        91WO-FR00701
                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers 1..170
                                                                                                                                                                                                                                                                                                                                                                                                         /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          groEL-1
                                                                                                                                     61.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           entry)
                                                                                                                                                                                                                                                                                                     G;
                                                                                                                                                                                                                         French.
                                                                                                                                                                                                                                                                                                                                                                                                         "HSP18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             540
                                                                                                                              87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene;
                                                                                                                             Score 1643.5; DB 1
Pred. No. 1.2e-105;
7; Mismatches 119;
                                                                                                                                                                                                                                                                                                                                                                                                         heat shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A
                                                                                                                                                                                                                                                                                                                                                                                                                                                           HSP18
                                                                                                                                                                                      the 56 kDa GroEL-1 protein which contains the 18 kDa HSP18 heat R22364.
                                                                                                                                                                                                                                                                                                                                                                                                        protein"
                                                                                                                                             DB_13; Length 540,
                                                                                                                             Indels
                                                                                                                             <u>ن</u>
                                                                                                                             Gaps
          238
                                                                                                             60
                                          180
                                                                                             61
                                                                                                                             4
                                                                                                                                                                                                                                                                                                                                                                               RESULT
P81351
 B
                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                      An isolated DNA molecule that consists essentially of the nucleotide sequence that corresponds to the sequence represented by position 3950 about 2390 and from position 3948 through position 2398 of N81768 is claimed. Also claimed is a peptide sequence that consists of a 5-40 AA residue sequence that corresponds to a sequence of the 540 AA residue protein (P81351) or the 517 AA residue protein (P81368) coded for by the DNA sequence. The proteins can be used for determining previous immunological exposure of a mammal to M.tuberculosis or M.bovis and
                                                                                                                                                                                                                                                                                                                                                       P81351;
Sequence
                                                                                                     Disclosure;
                                                                                                                                                                              Shinnick T,
                                                                                                                                                                                               (SCRI-) SCRIPPS CLINIC &
                                                                                                                                                                                                               24-FEB-1988;
                                                                                                                                                                                                                                25-FEB-1988;
                                                                                                                                                                                                                                                 07-SEP-1988
                                                                                                                                                                                                                                                                  W08806591-A
                                                                                                                                                                                                                                                                                   Mycobacterium
                                                                                                                                                                                                                                                                                                  Diagnosis; assay; M.bovis;
                                                                                                                                                                                                                                                                                                                                      29-DEC-1990
                                                                                                                                                                                                                                                                                                                                                                     P81351 standard; protein;
                 for producing
                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                 540 h 540
                                                                                                                                                                                                                                                                                                                                                                                                                                 538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                       4
                                                                                                                                                                                                                                                                                                                                                                                                                                H 538
                                                                                                                                                              1988-271136/38
                                                                                                                                                       N81768
 540
                                                                                                   Fig 2a-2d; 116pp;
                                                                                                                                                                               Houghten
                                                                                                                                                                                                                                                                                                                                     (first
                 a vaccine
                                                                                                                                                                                                                                                                                   tuberculosis
 A,
                                                                                                                                                                                                               88US-0159667
                                                                                                                                                                                                                                88WO-US00598
                                                                                                                                                                                                                                                                                                                                    entry)
                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                                                                                                                                                                                                                    vaccine.
                                                                                                    English.
```

```
Recombinant mycobacterial peptide(s) - used in assays for diagnosis of infection, vaccines and for producing antibodies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence of Mycobacterium tuberculosis 540 AA residue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                182 gvdldftegmafdkgylspymvtdqermeavlddpyilihqgkigsiqdllpllekviqa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKAE-DHDHHHGHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -avkvldd-nlgrtgdeatgvavvrraaveplrwiaenaglegyvittkvaeldkgggfn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   reklqerlaklaggvcvirvgaatevelkerkhrledaisatraaveegivsgggsalvh
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aeevglkldqagldvlgtarrvtvtkddttivdgggnaedvqgrvaqikaeiestdsdwd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggskplliiaedvegealstlvvnkirgtfnavavkapgfgdrrkamlgdmatltgatvi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVV
                           for
                           producing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
```

the

```
RESULT
R81610
                                                                                                                                                                                                                                                                                                                                                                                                                                      ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                10-OCT-1994;
21-MAR-1994;
22-MAR-1994;
                                                                                                                                                                                                                    Heat shock protein; mycobacterium tuberculosis; inflammatory disease; autoimmune disease; diabetes; arthritis; atherosclerosis; antibody; multiple sclerosis; myasthemia gravis; transplant rejection; diagnosi
 Anderton
                                                                                                     21-MAR-1995;
                                                                                                                              28-SEP-1995
                                                                                                                                                                               Mycobacterium
                                                                                                                                                                                                                                                                       Mycobacterium
                                                                                                                                                                                                                                                                                                                                                   R81610
                        (UYUT-) RIJKSUNIV UTRECHT
                                                                                                                                                                                                                                                                                                                                                                                                                  479
                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                tgvyedllaagvadpvkvtrsalqnaasiaglfltteavvadkpek 524
                                                                                                                                                                                                                                                                                                                                                                                                                                         TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aptldelk--legdeatganivkvaleaplkqiafnsglepgvvaekvrnlpaghglnaq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvtll-qa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     evgltlenadlsllgkarkvvvtkdettivegagdtdaiagrvagirqeiensdsdydre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        glqleltegmrfdkgyisgyfvtdperqeavledpyillvsskvstvkdllpllekviga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           avekvtetllkgakevetkeqiaataaisagdqsigdliaeamdkvgnegvitveesntf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aktiaydeearrglerglnaladavkvtlgpkgrnvvlekkwgaptitndgvsiakeiel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             edpyekigaelvkevakktddvagdgtttatvlagalvreglrnvaaganplglkrgiek
                                                                                                                                                                                                                                                                                                                                                   standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
 MS,
                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
 Van
                                                                                                                                                                                tuberculosis
                                                                                                                                                                                                                                                                       tuberculosis
                                                94EP-0202927.
94EP-0200721.
94EP-0200738.
                                                                                                     95WO-NL00108
                                                                                                                                                                                                                                                                                                                                                   protein;
 Der Zee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            59.3%;
æ
                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                     heat shock protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 1574.5; DB 9; Pred. No. 6.5e-101;
                                                                                                                                                                                                                                                                                                                                                   A
Van
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches 126;
Eden
Σ
                                                                                                                                                                                                                    transplant rejection; diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <del>--</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              hsp65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
```

RESULT W44702 ID W4

W44702 standard; Protein;

540 AΑ

```
οy
                                                                                                                                                 밁
                                                                                                                                                                                                                      뮻
                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         д
                                                                           맑
                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local S
Matches 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    represent regions of stress proteins that are highly conserved between microorganisms and animals. The immunisation was carried out in order protect the rat from inflammatory diseases. The inflammatory diseases that the peptides can be used to treat include autoimmune diseases such as diabetes, arthritis, atherosclerosis, multiple sclerosis and myasthemia gravis. They also prevent transplant rejection. Antibodies raised against the peptide sequences can be used in diagnosis, e.g. to measure expression of the epitopes at sites of inflammation, or to measure expression of the pitopes at sites of inflammation, or to measure expression of stressive immunisation. The peptide fragments corresponding to similar regions of mammalian stress proteins do not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This sequence represents the heat shock protein hsp65 of Mycobacterium tuberculosis. The peptide fragments of this sequence represented by R81611-R81623 were used to immunise rat T-cells. These peptide fragments
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and recombinant cells
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         elicit a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 4; Fig 13; 65pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Microbial stress protein fragments containing epitope(s) homologous to related mammalian epitope(s) - used to treat and prevent inflammation e.g. auto:immune diseases, also nucleic acids, vectors
   479
                                                                           421
                                                                                                           421
                                                                                                                                                                                    361
                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                             122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity hes 322; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1
                                   TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                  KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                          DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                            GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                  glqleltegmrfdkgyisgyfvtdperqeavledpyillvsskvstvkdllpllekviga
                                                                                                                                                                                                                                                                                                                                                                                            GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                            AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aktiaydeearrglerglnaladavkvtlgpkgrnvvlekkwgaptitndgvsiakeiel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgvyedllaagvadpvkvtrsalqnaasiaglfltteavvadkpek
                                                                       aptldelk--legdeatganivkvaleaplkqiafnsglepgvvaekvrnlpaghglnaq
                                                                                                           RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                               klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvtll-qa
                                                                                                                                                                                                                      evgltlenadlsllgkarkvvvtkdettivegagdtdaiagrvaqirqeiensdsdydre
                                                                                                                                                                                                                                                                                                                                                                                                                                         avekvtetllkgakevetkeqiaataaisagdqsigdliaeamdkvgnegvitveesntf 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1995-344587/44.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protective response
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59.3%; Score 1574.5; DB 16; Length 61.2%; Pred. No. 6.5e-101; tive 75; Mismatches 126; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Antibodies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                             480
                                                                                                                                                 420
                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    such
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
```

```
Ъ
                                                           δÃ
                                                                                           DЬ
                                                                                                                       Q
                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                         preventing an autoimmune disease in a mammal comprises: (a) (a) (b) providing a particle coated with an antigen against which an immune cresponse is mounted in the autoimmune disease; (b) delivering the particle into the recipient cell of the mammal; and (c) repeating (c) step (b) until either a reduction in a cytotoxic immune response or a desensitizing immune response is induced in the mammal.

Alternatively, step (a) comprises providing a nucleic acid construct comprising a coding sequence for the antigen, operably linked to control elements such that the coding sequence can be transcribed and translated in a recipient cell, and delivering the construct to the recipient cell using a gene gun. The antigen of step (a) is selected from collagen, Mt Hsp65, myelin basic protein, myelin colligodendrocyte glycoprotein, proteolipid protein, and epitopes thereof. These antigens mitigate cytotoxic responses and elicit
                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                         Matches
                                                                                                                                                                                                                                                 thereof. These antigens managed is used antigen desensitisation. The method is used rheumatoid arthritis or multiple sclerosis. use for the previously known Mt Hsp65.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis. This protein cross-reacts with component of articular cartilage, human Hsp60, that is up-re
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Treatment of autoimmune diseases - by administering autoantigen-coated particles or autoantigen-encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           03-JUN-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         03-JUN-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        03-JUN-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          in the joints of arthritic patients. The Mt Hsp65 gene sequen (see V05708) is also provided. A claimed method for treating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This protein comprises the 65 kDa heat shock protein, Mt Hsp65, of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Haynes JR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11-DEC-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO9746253-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (AURA-) AURAGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W44702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22-JUN-1998
   121
                               62
                                                            61
                                                                                       AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                            edpyekigaelvkevakktddvagdgtttatvlaqalvreglrnvaaganplglkrgiek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1998-041892/04
                                            EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shock protein; Mt Hsp65; autoimmune disease; immunotherapy;
therapy; rheumatoid arthritis; multiple sclerosis.
                                                                                                                                                       322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Page
                                                                                                                                                                                                                                    540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Prayaga
                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97US-0019100
96US-0019100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97WO-US09427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          55-58;
                                                                                                                                                                    59.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     72pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ramshaw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           65
                                                                                                                                                       75;
                                                                                                                                                    Score 1574.5; DB 19;
Pred. No. 6.5e-101;
5; Mismatches 126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         kDa heat shock protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  autoantigen-encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The Mt Hsp65 gene sequence
                                                                                                                                                                                                                                                                               especially for treating It represents a novel
                                                                                                                                                       Indels
                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           is up-regulated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nucleic
                                                                                                                                                                                      540;
                                                                                                                                                       ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or,
                                                                                                                                                    Gaps
                            121
                                                                                           61
                                                                                                                         60
                                                                                                                                                       2
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                             Y23905-30 represent heat shock proteins (Hsps). The specification describes Streptococcal Hsps, designated Hsp60. These proteins, their fragments, variants and fusion proteins, are used to elicit or enhance an immune response against Streptococcus, and to elicit a similar response to a target antigen fused to the protein. Unlike other
                                                                                                                     immunological carriers, Hsp60 proteins are not immunosuppressive provide an increased response to any conjugated or fused antigen where used for cancer control, they lack the side effects associately the state of 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New nucleic acid encoding heat shock protein-60 from Streptococcus, useful in vaccines, as carriers for other immunogens, as anticancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (STRE-) STRESSGEN BIOTECHNOLOGIES CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            31-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           29-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      W09935270-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Heat shock protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Amino acid sequence of a heat shock protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            22-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Y23911 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                122
                      endotoxins. They can also be used to in treatment or prevention of tumours
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1999-430397/36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aptldelk--legdeatganivkvaleaplkqiafnsglepgvvaekvrnlpaghglnag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       {\bf klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvtll-qaalige and all of the contractions of the contraction of the co
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            evgltlenadlsllgkark vvvtk dettive gagdt daia grvagir geiens ds dydrenadlsllgkark vvvtk dettive gagdt daia grvagir geiens ds dydrenadlsllgkark vvvtk dettive gagdt daia grvagir geiens data grand by the statement of the statemen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgvyedllaagvadpvkvtrsalqnaasiaglfltteavvadkpek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               control;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Wisniewski
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Fig 10A-E; 176pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       diagnosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97US-0001737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 98WO-CA01203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tumour;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hsp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sarcoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  immune response; immunological carrier;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ..
= ::
::
..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cancer; gene therapy
detect specific antibodies (e.g. sarcoma or corrected)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   524
                                                                                                                                                                                   Also,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
```

and in

cancers of

```
RESULT Y14909 ID Y1 ACC Y1 ACC Y1 ACC Y1 DT 25 AT ACC Y1 A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 322
                                                                                                                                                                                                                                                                                                                   Mycobacterium vaccae protein; antigen; T cell activation; cytokine; dendritic cell maturation; infectious disease; immune disorder; can
                                                                                                                                                                                                                                            dermatitis;
                                                                                                                                                                                                                                                                  respiratory system; mycobacterial infection; allergy; tuberculosis; leprosy; sarcoidosis; lung cancer; asthma; skin disorder; psoriasis
                                                                                                                                                                                                                                                                                                                                                                                                  Amino acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Y14909;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Y14909 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          breast, ovary, prostate, lung, pancreas or liver). The Hsp60 polynucleotide is used for recombinant production of the protein, as a source of primers and probes for detecting streptococci in standard hybridization/amplification assays, and therapeutically in gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-OCT-1999
                                                         01-JUL-1999
                                                                                                                                                                Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                            WO9932634-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Si
hes 322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgvyedllaagvadpvkvtrsalgnaasiaglfltteavvadkpek 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvtll-qa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 glqleltegmrfdkgyisgyfvtdperqeavledpyillvsskvstvkdllpllekviga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a vek v \texttt{tetllkgake} ve \texttt{tkeqiaa} \texttt{taaisagdqsigdliae} a \texttt{mdkvgnegvitveesntf}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aptldelk--legdeatganivkvaleaplkqiafnsglepgvvaekvrnlpaghglnaq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          {\tt gkplliiaedvegealstlvvnkirgtfksvavkapgfgdrrkamlqdmailtggqvise}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          vectors.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                    cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    540 AA;
                                                                                                                                                                                                                                            eczema; alopecia areata;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                vaccae
                                                                                                                                                                                                                    carcinoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein;
                                                                                                                                                                                                                                                                                                                                                                                                  of M. vaccae antigen GV-27.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            59.3%; Score 1574.5; 61.2%; Pred. No. 6.5
                                                                                                                                                                                                                 melanoma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         No. 6.5e-101; smatches 126;
                                                                                                                                                                                                                                            skin
                                                                                                                                                                                                                                            cancer; basal carcinoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                        cancer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2
```

```
Дb
                          Š
                                                            밁
                                                                                       Š
                                                                                                                    В
                                                                                                                                                δÃ
                                                                                                                                                                                В
                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                   Db
                                                                                                                                                                                                                                                                                                                             å
                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cytokines, to enhance the expression of co-stimulatory molecules on dendritic cells and monocytes, and to enhance dendritic cell maturation and function. The proteins can be expressed by standard recombinant methodology. Pharmaceutical compositions comprising the proteins or nucleic acid sequences encoding the proteins can be used for the treatment, prevention, and detection of disorders including infectious diseases, immune disorders and cancer. In particular, the compounds and methods are used for treatment of diseases of the respiratory system, such as mycobacterial infections, asthma, allergies, tuberculosis, leprosy, sarcoidosis and lung cancers, and disorders of the skin such as psoriasis, atopic dermatities, eczema, allergie contact dermatitis, alopecia areata, and skin cancers such as basal carcinoma, squamous cell carcinoma and melanoma.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23-DEC-1997;
23-DEC-1997;
11-JUN-1998;
17-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     T cells
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Enhancing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          04-DEC-1998;
23-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (GENE-) GENESIS RES & DEV CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         23-DEC-1998;
 362
                             361
                                                            302
                                                                                        301
                                                                                                                    242
                                                                                                                                                  241
                                                                                                                                                                                182
                                                                                                                                                                                                             181
                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                              N
                                                                                                                                                                                                                                                                                                                                                                                          1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       invention provides heat-killed Mycobacterium vaccae, or revaccae proteins. The M. vaccae proteins may be employed to sells and natural killer cells, to stimulate the production
                                                                                                                                    GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                       GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                             1999-430163/36
            KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHOA
                                                                                       DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                    gkpllilaedvegealstlvvnkirgtfksvavkapgfgdrrkamlqdmailtggqvvse
                                                                                                                                                                              glqleltegmrfdkgyisgyfvtdaerqeavledpyillvsskvstvkdllpllekviqa
                                                                                                                                                                                                                                      aveavtqsllksakevetkeqisataaisagdtqigeliaeamdkvgnegvitveesntf 181
                                                                                                                                                                                                                                                                       AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                   edpyekigaelvkevakktddvagdgtttatvlagalvreglrnvaaganplglkrgiek 121
                                                                                                                                                                                                                                                                                                                 EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAAGVNPVALGVGIGK
klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvall-qs
                                                           rvglsletadvsllgqarkvvvtkdettivegsgdsdalagrvaqiraelensdsdydre
                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              immune response to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RL,
                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  213-214;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98US-0205426.
97US-0996624.
97US-0997080.
97US-0997362.
98US-0095855.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Skinner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98US-0156181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98WO-NZ00189
                                                                                                                                                                                                                                                                                                                                                                                                                                    59.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243pp;
                                                                                                                                                                                                                                                                                                                                                                                                                   79;
                                                                                                                                                                                                                                                                                                                                                                                                                      Score 1574.5; DB 20;
Pred. No. 6.5e-101;
79; Mismatches 122; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               an antigen
                                                                                                                                                                                            ..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Visser
                                                                                                                                                                                                                                                         =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ES,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Watson
                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ū
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ť
                                                                                                                                                                                                                                                                                                                                                                                                                        ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      recombinant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      activate
                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                       180
                               420
                                                                                          360
                                                                                                                                                                                241
                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                            60
                                                            361
                                                                                                                        301
```

421

RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN

```
PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING PROSULTING 
δÃ
                                                  밁
                                                                                        QΥ
                                                                                                                                            B
                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The gene was isolated by probing a lambda gtll expression library of M.tuberculosis DNA with monoclonal antibodies directed against M.tuberculosis-specific antigens. 19kD, the 71kD and the 65kD protein and genes are claimed, and so is a vaccine comprising DNA encoding M.tuberculosis protein in a recombinant vaccine vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Genes encoding Mycobacterium tuberculosis protein antigens useful for developing reagents for diagnosis, prevention ar treatment of tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 12; Fig 6; 82pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             02-FEB-1987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-FEB-1988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11-AUG-1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W08805823-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Antigen; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1988-235175/33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (WHIT-) WHITEHEAD INST BIOM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19-MAR-1991 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      P80215 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         P80215;
                                                                                               181
                                                                                                                                               142
                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                          82
                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
les 322; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9
GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                     glqleltegmrfdkgyisgyfvtdperqeavledpyillvsskvstvkdllpllekviga
                                                                                          GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                          avekvtetllkgakevetkeqiaataaisagdqsigdliaeamdkvgnegvitveesntf
                                                                                                                                                                   AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAKA 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             560 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Young
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          87US-0010007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             88WO-US00281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ds
                                                                                                                                                                                                                                                                                                                                                                                                                                                           59.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Shinnick
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                    75;
                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 1574.5; DB 9;
Pred. No. 6.8e-101;
75; Mismatches 126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ĀΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         65kD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          proteins
                                             261
                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                         81
                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            478
                                                                                                                                                                                                                                                                                                                                                                                                                                    2
```

```
\begin{array}{c} \mathbf{X} \times \mathbf{X} \times \mathbf{Y} \times \mathbf{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 10
W32100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                This is the heat shock protein hsp65 which can be used in a novel method to treat autoimmune disease e.g. rheumatoid arthritis. This sequence is known to be an immunodominant antigen in a number of infectious diseases and is linked to pristane induced arthritis (PIA) in vitro. HSP's from microbial sources may act as self antigens and thus have limited use whereas the human hsp65 homologue, hsp58 or fragments of the hsp58 protein may be useful in the development of vaccines for prophylaxis or treatment of an autoimmune disease such as rheumatoid arthritis.

Note: this hsp65 sequence given in the sequence specification (see W32099).
      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Disclosure; Fig 4; 91pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Polypeptide(s) derived from microbial heat shock protein for treatment of autoimmune disease esp. arthritis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     03-APR-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacteria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pristane induced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Heat shock protein; hsp58; human; autoimmune disease; hsp65; rheumatoid arthritis; antigen; infectious disease; prophylac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       08-APR-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W32100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W32100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27-SEP-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   26-SEP-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO9711966-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacteria sp. heat shock protein 65 (hsp65) #2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (PEPT-) PEPTIDE THERAPEUTIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361 KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   evgltlenadlsllgkarkvvvtkdettivegagdtdaiagrvaqirqeiensdsdydre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          aptldelk--legdeatganivkvaleaplkqiafnsglepgvvaekvrnlpaghglnaq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvtll-qa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      standard;
      540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sp.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                95GB-0019737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96WO-GB02382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          itis; antigen;
arthritis; PIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PIA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                infectious disease;
A; vaccine.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      prophylactic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        321
```

Best Local Similarity 61. Matches 321; Conservative

59.3%;

Score 1572.5; Pred. No. 8.96

5; DB 18; .9e-101;

Length 540; Ψ

76;

Mismatches

Indels

Gaps

2

Query Match

```
RESULT 11
W60144
ID W60144
XX W60144
XX W60144
XX W60144
XX W700b
XX M700b
XX M81;
DR W81;
DR W81;
DR W950
XX M700b
PT M700b
PT M700b
PT M700b
                                                                                                    Hiyama
Visser
                                                                                                                                                                                                                                                                                                                       Mycobacterium vaccae; antigen; therapy; prevention; cytokine production; M. avium; M. tuberculosis; immune response enhancer; cell proliferation; mycobacteria infection; vaccine; cancer.
       Mycobacterium vaccae polypeptides - used to develop products for use in detection, therapy and prevention of mycobacteria infections or as immune response enhancers
                                                              N-PSDB;
                                                                         WPI; 1998-216926/19
                                                                                                                                                                                                                                                                                              Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                              W60144 standard;
                                                                                                                                                                       12-JUN-1997;
29-AUG-1996;
                                                                                                                                                                                                              28-AUG-1997;
                                                                                                                                                                                                                                           05-MAR-1998
                                                                                                                                                                                                                                                                                                                                                                                                         25-AUG-1998
                                                                                                                                            (GENE-) GENESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             evgltlenadlsllgkarkvvvtkdettivegagdtdaiagrvaqirqeiensdsdydre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvtll-qa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aptldalk--legdeatganivkvaleaplkqiafnsglepgvvaekvrnlpaghglnaq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aktiaydeearrglerglnaladavkvtlgpkgrnvvlekkwgaptitndgvsiakeiel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   V34608
                                                                                                                  Prestidge
                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                               vaccae
                                                                                                                                                                     97US-0873970.
96US-0705347.
                                                                                                                                                                                                                97WO-NZ00105
                                                                                                                                            RES & DEV CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Protein;
                                                                                                                                                                                                                                                                                                                                                                              GV-27
                                                                                                                 RL,
                                                                                                                                                                                                                                                                                                                                                                             sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                               523
                                                                                                                  Scott
                                                                                                                                                                                                                                                                                                                                                                                                                                                               æ
                                                                                                                  Ĭ,
                                                                                                                  Skinner
                                                                                                                    MΑ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   =
                                                                                                                  ۵,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
```

밁 δÃ ₽ Ş Вp Ş B 밁 γ 밁 Q 밁 QΥ 밁 δ 밁 Š

```
KKW XE XEX
                                                                                                                                                          RESULT
Y14891
                                                                                                                                                                                                                                                                        Вp
                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            provides M. vaccae polypeptides that comprise an immunogenic portion of a soluble M. vaccae antigen, or a variant, where the antigen induces an immune response in patients previously exposed to a mycobacterium. Such M. vaccae polypeptides can be used in methods for enhancing non-specific immune response. The methods and products can be used for the detection, treatment and prevention of infectious diseases caused by mycobacteria such as M. vaccae, M. avium or M. tuberculosis. The products also have the ability to induce cell proliferation and cytokine production (e.g. interferon-gamma and interleukin-12 production) in T cells, NK cells, B cells, or macrophages. They can be used for enhancing immune responses for use in vaccines or immunotherapy of infectious diseases and cancers.
                                                      Amino
                                                                                   25-OCT-1999
                                                                                                                Y14891
                                                                                                                                           Y14891 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 47; Pages 115-116; 153pp;
                                                                                                                                                                                                                 479
                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Simhes 321;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                       12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                             glqleltegmrfdkgyisgyfvtdaerqeavledpyillvsskvstvkdllpllekviqa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aveavtqsllksakevetkeqisataaisagdtqigeliaeamdkvgnegvitveesntf 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 apalddl--gltgdeatganivrvalsaplkqiafngglepgvvaekvsnlpaghglnaa
                                                                                                                                                                                                                                                                                                                                            KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                   DAGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AADAVFEALLASATPVSGKTGIAQVATVSSRDEQIGDLVGEAMNKVGHDSVVSVKESSTL 180
                                                                                                                                                                                                                                           TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP
                                                                                                                                                                                                                                                                                                    RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN 480
                                                                                                                                                                                                                                                                                                                             klqerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvall-qs
                                                                                                                                                                                                                                                                                                                                                                                       rvglsletadvsllgqarkvvvtkdettivegsgdsdaiagrvaqiraeiensdsdydre
                                                                                                                                                                                                                                                                                                                                                                                                                                              gkplliiaedvegealstlvvnkirgtfksvavkapgfgdrrkamlqdmailtgggvvse
                                                      acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                      sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                   (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ĀΑ;
                                                                                                                                         protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59.0%;
                                                      of M.
                                                                                   entry;
                                                      vaccae
                                                                                                                                           523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1566.5;
Pred. No. 2.2e
79; Mismatches
                                                                                                                                           AΑ
                                                                                                                                                                                                                                                                                   -
-
-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            vaccae antigen GV-27. The invention
                                                     antigen GV-27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .2e-100;
es 121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 19; Length
                                                                                                                                                                                                                                             524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ω
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                               301
```

ζ.

Mycobacterium vaccae protein; antigen; T cell activation; cytokine; dendritic cell maturation; infectious disease; immune disorder; can respiratory system; mycobacterial infection; allergy; tuberculosis;

В δÃ

밁 Qγ Qy

밁 Qy

밁

```
B
                                                                                           Qy
                                                                                                                            DЪ
                                                                                                                                                    ΩY
                                                                                                                                                                                      В
                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                          δÃ
      밁
                            Qγ
                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                            Query Match
Best Local S
Matches 321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23-DEC-1997;
23-DEC-1997;
11-JUN-1998;
17-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                             The invention provides heat-killed Mycobacterium vaccae, or recombinant M. vaccae proteins. The M. vaccae proteins may be employed to activate T cells and natural killer cells, to stimulate the production of cytokines, to enhance the expression of co-stimulatory molecules on dendritic cells and monocytes, and to enhance dendritic cell maturation and function. The proteins can be expressed by standard recombinant methodology. Pharmaceutical compositions comprising the proteins or nucleic acid sequences encoding the proteins can be used for the treatment, prevention, and detection of disorders including infectious diseases, immune disorders and cancer. In particular, the compounds and methods are used for treatment of diseases of the respiratory system, such as mycobacterial infections, asthma, allergies, tuberculosis, leprosy, sarcoidosis and lung cancers, and disorders of the skin such as psoriasis, atopic dermatitis, eczema, allergie contact dermatitis.
                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                   alopecia areata, and skin cancers such as basal carcinoma,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Enhancing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 1999-430163/36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Prestidge RL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    04-DEC-1998;
23-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                       carcinoma and melanoma.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Example 14; Page 189-190; 243pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (GENE-) GENESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W09932634-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        squamous cell carcinoma; melanoma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       leprosy; sarcoidosis; lung cancer; asthma; skin disorder; psoriasis; dermatitis; eczema; alopecia areata; skin cancer; basal carcinoma;
      242
                                                               182
                                                                                                                              122
                                 241
                                                                                              181
                                                                                                                                                          121
                                                                                                                                                                                         62
                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                  N
                                                                                                                                                                                                                                                                               1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
                                                                                                                      GKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVNP||||||:|||||||||:||:||||||:||:gkpllilaedvegealstlvvnkirgtfksvavkapgfgdrrkamlqdmailtggqvvse
                                                                                                                                                                                                    EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                              glqleltegmrfdkgyisgyfvtdaerqeavledpyillvsskvstvkdllpllekviqa
                                                                                           GTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAGT
                                                                                                                                                                                                                                               aktiaydeearrglerglnaladavkvtlgpkgrnvvlekkwgaptitndgvsiakeiel
                                                                                                                                                                                                                                                                                                             321;
                                                                                                                                                                                    edpyekigaelvkevakktddvagdgtttatvlaqalvreglrnvaaganplglkrgiek
                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Z11343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                immune
                                                                                                                                                                                                                                                                                                                                                                                        523
                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            vaccae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98US-0205426.
97US-0996624.
97US-0997080.
97US-0997362.
98US-0095855.
98US-0156181.
                                                                                                                                                                                                                                                                                                                                                                                        AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Skinner MA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 98WO-NZ00189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RES & DEV CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                response to
                                                                                                                                                                                                                                                                                                          59.0%; Score 1566.5; DB 20; Lengt 61.3%; Pred. No. 2.2e-100; tive 79; Mismatches 121; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Tan P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Visser ES,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Watson J;
                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                   squamous cell
                                                                                                                                                                                                                                                                                                            ω
••
                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                      12]
                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                            2
                                                                                                                                              • •
```

 $\begin{array}{l} \mathbf{x} \times \mathbf{C} \cap \mathbf$

```
RESULT
Y23930
                       response to a target antigen fused to the protein. Unlike other immunological carriers, Hsp60 proteins are not immunosuppressive so provide an increased response to any conjugated or fused antigen. Also, where used for cancer control, they lack the side effects associated with endotoxins. They can also be used to detect specific antibodies and in treatment or prevention of tumours (e.g. sarcoma or cancers of breast, ovary, prostate, lung, pancreas or liver). The Hsp60 polynucleotide is used for recombinant production of the protein, as a source of primers and probes for detecting streptococci in standard hybridization/amplification assays, and therapeutically in gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        agents
                                                                                                                                                                                                                                                                                                                               Y23905-30 represent heat shock proteins (Hsps). The specification describes Streptococcal Hsps, designated Hsp60. These proteins, their fragments, variants and fusion proteins, are used to elicit or enhance
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New nucleic acid encoding heat shock protein-60 from Streptococcus, useful in vaccines, as carriers for other immunogens, as anticancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 1999-430397/36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mizzen L, Wisniewski
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      31-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO9935270-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Heat shock protein; Hsp; immune response; immunological
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Consensus mino acid sequence of a heat shock protein
therapy vectors
                                                                                                                                                                                                                                                                                                        an immune response against Streptococcus, and to elicit a similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Y23930 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (STRE-) STRESSGEN BIOTECHNOLOGIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKP 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEBGIVPGGGASLIHQA 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tgeyedllkagvadpvkvtrsalqnaasiaalfltteavvadkp 522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \verb|apalddl--gltgdeatganivrvalsaplkgiafngglepgvvaekvsnlpaghglnaa|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           klgerlaklaggvavikagaatevelkerkhriedavrnakaaveegivagggvall-qs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and for diagnosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     control;
                                                                                                                                                                                                                                                                                                                                                                                                                                           Fig 10A-E; 176pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97US-0001737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             98WO-CA01203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tumour;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sarcoma; cancer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene therapy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  carrier;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
```

Sequence

545 AA

62.2%;

Pred. No. 1.3e-99;

```
RESULT 14
W32099
ID W32099
XX
AC W32099
XX
DT 08-APF
δÃ
                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity Matches 328; Conserv
                                                                                                                                                                                                 Heat shock protein; hsp58; human; autoimmune disease; hsp65; rheumatoid arthritis; antigen; infectious disease; prophylactic; pristane induced arthritis; PIA; vaccine.
           Polypeptide(s) derived from microbial heat shock protein for treatment of autoimmune disease esp. arthritis
                                                                                (PEPT-) PEPTIDE THERAPEUTIC
                                                                                                                      26-SEP-1996;
                                                                                                                                          03-APR-1997
                                                                                                                                                                              Mycobacteria sp.
                                                                                                                                                                                                                                         Mycobacteria sp.
                                                                                                                                                                                                                                                                                                   W32099 standard;
                                         WPI; 1997-212851/19
                                                                                                   27-SEP-1995;
                                                                                                                                                             WO9711966-A1
                                                                                                                                                                                                                                                                                                                                                    478
                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           122
                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ۲
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                                                                                                                                                                                                                                                                                                                                              aapaldklkte-ngdeatgvnivlraleaplrqiaenaglegsvvvekvknseag-gyna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL :| |:: | |||| ||: || ||| ||:|||||
                                                                                                                                                                                                                                                                                                                                                                                                             ARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLNV 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TGKPLLIVAEDVEGEALATLVVNAIRKTLKAVAVKGPYFGDRRKAFLEDLAVVTGGHVVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   letelevvegmqfdrgyispyfitdsekqkaeledplilltdkkisniqdllpvleevaq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEKVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                edkfenmgaqlvkevasktndvagdgtttatvlaqaivkeglknvaaganpmdlrrgidk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      akdikfgeearramlrgvnaladavkvtlgpkgrnvvleksfgaptitkdgvtvakeiel
                                                           Thompson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                            (first entry)
                                                                                                   95GB-0019737
                                                                                                                      96WO-GB02382
                                                                                                                                                                                                                                         heat shock protein
                                                                                                                                                                                                                                                                                                  protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             79;
                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                         65 (hsp65)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             115;
                                                                                                                                                                                                                                          #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                    524
                     - useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5
```

```
RESULT
R04716
                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                              ρЬ
                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8x3555555555555
                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This is the heat shock protein hsp65 which can be used in a novel method to treat autoimmune disease e.g. rheumatoid arthritis. This sequence is known to be an immunodominant antigen in a number of infectious diseases and is linked to pristane induced arthritis (PIA) in vitro. HSP's from microbial sources may act as self antigens and thus have limited use whereas the human hsp65 homologue, hsp58 or fragments of the hsp58 whereas the human hsp65 homologue, hsp58 or fragments of treatment of an autoimmune disease such as rheumatoid arthritis. Note: this sequence is given in the sequence specification but differs slightly from the hsp65 sequence represented in Figure 4 (see W32100).
                         Homo sapiens
                                                   Stress protein; vaccine; human
                                                                                             Amino acid sequence of the
                                                                                                                         03-JUL-1990
                                                                                                                                                                                R04716 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Disclosure; Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                     479
                                                                                                                                                                                                                                                                               477
                                                                                                                                                                                                                                                                                                         422
                                                                                                                                                                                                                                                                                                                                    417
                                                                                                                                                                                                                                                                                                                                                                                                                      302
                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                          357
                                                                                                                                                                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                           15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL 50
                                                                                                                                                                                                                                                 l-qaaptldalk--legdeatganivkvaleaplkgiafnsglepgvvaekvrnlpaghg
                                                                                                                                                                                                                                                                                                                                                                                                                 AADAVFEALLASATPVSGKTGIAQVATVSSRD----EQIGDLVGEAMNKVGHDSVVSVKE 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aktiaydeearrglerglnaladavkvtlgpkgrnvvlekkwgaptitndgvsiakeiel 61
                                                                                                                                                                                                                                                                                                                       IHQARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHG
                                                                                                                                                                                                                                                                                                                                                              SSTLGTELEFTEGIGFHKGFLSAYFVTDFDNQQAVLEDALILLHQDKISSLPDLLPLLEK.236
                                                                                                                                                                                                                                                                                                                                                                                          WDREKLGERLAKLAGGVAVIKVGAATDTALKERKESVEDAVAAAKAAVEEGIVPGGGASL 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     avekvtetlikgakevetkeqiaataaisagdqsigdsigdliaeamdkvgnegvitvee 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            edpyekigaelvkevakktddvagdgtttatvlagalvreglrnvaaganplglkrgiek 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EDPFEDLGAQLVKSVATKTNDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sntfglqleitegmrfdkgyisgyfvtdperqeavledpyillvsskvstvkdllpllek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                         (first
                                                      Р1
                                                                   heat shock
                                                                                                                                                                              protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           69-71;
                                                     protein;
                                                                                                                       entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       58.6%;
60.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           91pp;
                                                                                                                                                                                 572
                                                   protein; Mycobacterium tuberculosis protein;
Mycobacterium; immunotherapeutic agent.
                                                                                               65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1554.5; DB 18; Length Pred. No. 1.6e-99;
                                                                                               kDa Mycobacterium tuberculosis protein.
                                                                                                                                                                                A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          127; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       544;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Saps
                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                            478
```

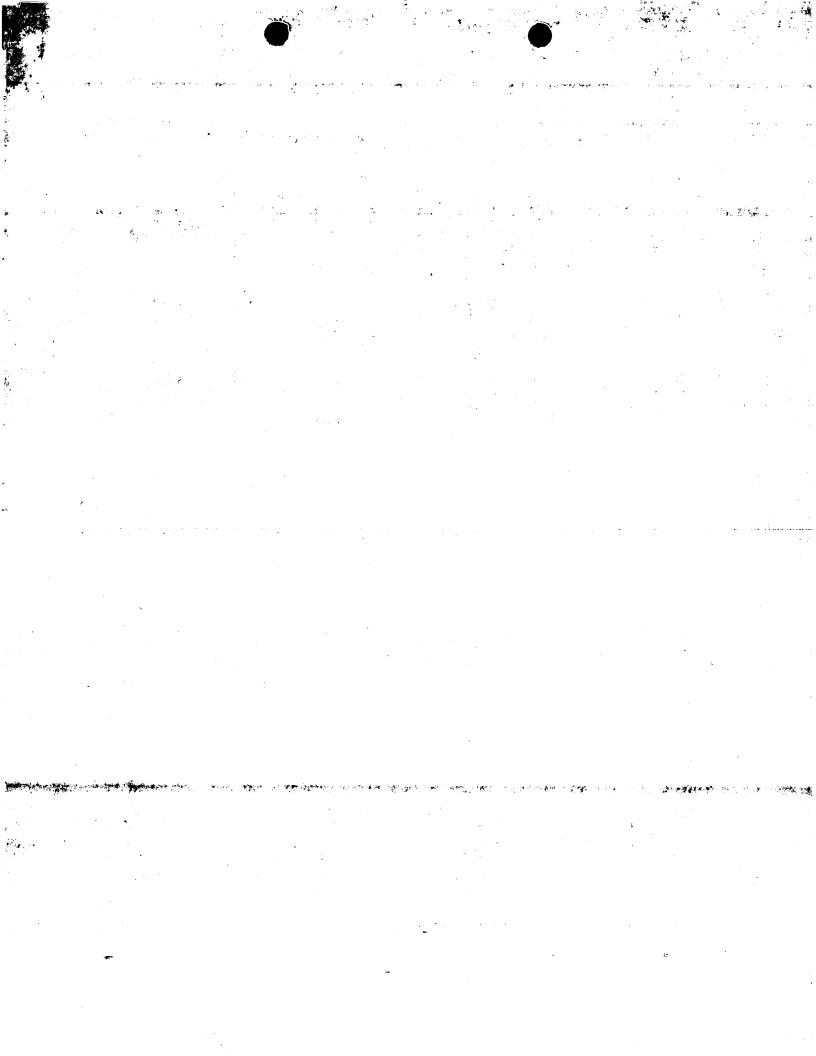
ω

WO8912455-A

```
ρy
                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                     В
                                             В
                                                                        γQ
                                                                                                      В
                                                                                                                             Q
                                                                                                                                                             Вþ
                                                                                                                                                                                       Qy
                                                                                                                                                                                                                        рь
                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                            дЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity 61.2
Matches 323; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     involved in humoral and cell-mediated immune responses, and in order to establish the functions of these proteins, several of the M. tuberculosis and M. leprae antigens have been sequenced. They exhibit sequence similarity to known stress-induced proteins. The mycobacterial stress proteins are recognised by human Abs and T. lymphocytes, and the evidence suggests that these proteins are among the major targets of the human cell mediated immune response. Sequence analysis reveals that mycobacterial hsp60 (alias 65 kDa antigen, groEL) is the major target of the murine antibody response to both M. tuberculosis and M. leprae. Comparison of the amino acid sequences of human pl protein and the 65 kDa M. tuberculosis protein revealed 257/540 identities.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Use of stress proteins -
for induction or enhancement of immune response or as
immuno:therapeutic agent in treatment of auto-immune diseases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The stress proteins of Mycobacterium tuberculosis and M. leprae are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Example; Fig 4; 42pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 1990-022380/03
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Young A, Young
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15-JUN-1988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15-JUN-1989;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           28-DEC-1989
                                               445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MEDI ) MEDICAL RESEARCH COUNCIL (WHIT-).
                  479
                                                                                                                                                                326
                                                                                                                                                                                                                                                                               386
                                                                                                                                   359
                                                                                                                                                                                            300
                                                                                                                                                                                                                           266
                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                         146 avekvtetllkgakevetkeqiaataaisangdqsigdliaeamdkvgnegvitveesnt
                                                                                                                                                                                                                                                                                                                                                                        121 AADAVFEALLASATPVSGKTGIAQVATVSSR-DEQIGDLVGEAMNKVGHDSVVSVKESST
                                                                                                                                                                                                                                                                                                                                                                                                      86
                                                                                                                                                                                                                                                                                                                                                                                                                   61 EDPFEDLGAQLVKSVATKINDVAGDGTTTATILAQALIKGGLRLVAAGVNPVALGVGIGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                            26 aktiaydeearrglerglnaladavkvtlgpkgrnvvlekkwgaptitndgvsiakeiel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 SKLIEYDETARRAMEVGMDKLADTVRVTLGPRGRHVVLAKAFGGPTVTNDGVTVAREIEL
VNTLSYGDLAADGVIDPVKVTRSAVLNASSVARMVLTTETVVVDKPAK 526
                                                                                                  qaaptldelk-plegdeatganivkvaleaplkqiafnsglepgvvaekvrnlpaghgln
                                                                                                                                                            egygltlenadisllgkarkvvvtkdettivegagdtdaiagrvaqirqeiensdsdyd
                                                                                                                                                                                                                     QARKALTELRASLTGDEVLGVDVFSEALAAPLFWIAANAGLDGSVVVNKVSELPAGHGLN
                                                                                                                                                                                            PD-AGIVLREVGLEVLGSARRVVVSKDDTVIVDGGGTAEAVANRANHLRAEIDKSDSDWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  88US-0207298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             89WO-US02619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    58.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Score 1552; DB 11;
; Pred. No. 2.5e-99;
73; Mismatches 128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 572;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.
                                                                                                                                                               385
                                                                                                                                                                                                                                                                                  265
                                                                                                                                                                                                                                                                                                             239
                                                                                                                                                                                                                                                                                                                                            205
                                                                                                                                                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                                                                                     145
                                                                                                                                                                                                                                                                                                                                                                                                                                                             85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.
```

Db 504 aqtgvyedllaagvadpvkvtrsalqnaasiaglfltteavvadkpek 551

Search completed: January 5, 2001, 14:26:28 Job time: 185 sec



```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               otal number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nucleic - nucleic search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                   seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                   length:
length:
                                                                                                                                                                                                                                                                                                                                                                                                               : Minimum I
Maximum
Listing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hits satisfying
    EST: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDENTITY_NUC Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-461-774-3
1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 January 12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7991742 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GenCore version
Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gcggccatgtggcgccgcag.....
                                                                                                                                                                                                                                                                                                                                                 gb_est1:*
gb_est2:*
gb_est3:*
gb_est4:*
gb_est5:*
  9best10:
9best11:
9best11:
9best13:
9best13:
9best14:
9best15:
9best16:
9best18:
9best18:
9best18:
9best20:
9best21:
9best21:
9best21:
9best22:
9best23:
9best23:
9best24:
9best24:
9best276:
                                                                                                                                                                                                                                                                                                                                 gb_est6:*
gb_est7:*
                                                                                                                                                                                                                                                                                                             gb_est9:*
                                                                                                                                                                                                                                                                                                                        gb_est8
                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
20000000000
                                                                                                                                                                                                                                                                                                                                                                                                                 m Match 0%
m Match 100%
g first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2001, 18:01:13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gapext
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3503743858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               chosen
                                                                                                                                                                                                                                                                                                                                                                                                                  summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .
5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Search time 3358.72 Seconds (without alignments) 3254.716 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .gtctgcggtgcgcgcctga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1560
   em_estro09:
em_estro11: *
em_estro11: *
em_estro11: *
em_estro12: *
em_estro13: *
epb_estr013: *
epb_est44: *
gpb_est44: *
gpb_est446: *
gpb_est446: *
gpb_est446: *
gpb_est451: *
gpb_est551: *
gpb_est552: *
gpb_est554: *
gpb_est552: *
gpb_est552: *
gpb_est572: *
gpb_est572: *
gpb_est6772: *
gpb_est772: *
                                                                                                                                                                                                                                                                                                                      em_estro6:*
em_estro7:*
em_estro8:*
                                                                                                                                                                                                                                                                                                                                                em_estro2:*
em_estro3:*
em_estro4:*
em_estro5:*
                                                                                                                                                                                                                                                                                                                                                                                   em_estpl1:*
em_estpl1:*
em_estpl1:*
em_estpl1:*
em_estpl1:*
em_estpl4:*
em_estpl5:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     em_esthum10:
em_esthum11:
em_esthum12:
em_esthum13:
em_esthum14:
em_esthum16:
em_esthum17:
em_esthum17:
em_esthum19:
em_esthum19:
em_esthum19:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              em_esthum2:*
em_esthum3:*
em_esthum6:*
em_esthum7:*
em_esthum7:*
em_esthum8:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                   em_estin4:*
em_estov1:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    em_estin2:*
em_estin3:*
```

```
1117:
1119:
1119:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:
1120:

em_estp16:
em_estp17:
em_estp17:
em_estp17:
em_estro18:
em_estro18:
em_estro16:
em_estro16:
em_estro17:
em_estro17:
em_estro17:
em_estro18:
em_estro18:
em_estro18:
em_estro19:
gb_est66:
gb_est66:
gb_est66:
gb_est66:
gb_est66:
gb_est66:
gb_est66:
gb_est63:
gb_est66:
gb_est66:
gb_est66:
gb_est68:
gb_est68:
gb_est77:
gb_est77:
gb_est78:
gb_est78:
gb_est88:
em_gss1:
gb_gss1:
gb_gss1:
em_gss1:
gb_gss1:
gb_gss1:
em_gss1:
gb_gss1:
gb_gss1:
em_gss1:
gb_gss1:
gb_gss2:
gb_gss1:
gb_gss2:
gb_gss1:
gb_gs
```

۵	92	191:	90
96628	gss27:	gb_gss26:*	gss25:

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

. 4		C 42	41	c 40	39					C 34			c 31		c 29			960		2 6				c 19				7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		12	11	10		ი დ -	7 (טס	0		N		Result No.
47.2	٠,	· `	48	48	48	48	48	48	8	•	8	49	49	49	١٩	۰ ۹	٠ ٥	49.4	9 4	?	G	51	\vdash	51.4	μ.	51.6	٠,	л:	52.4	ں د	1 (J 4-	տ	σ.	56.2	٦:	57 4	٦.		4	4	Score
ب بر ص د			3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3. ₁	3.1					•			•	ω.							ں س ء ہ					ω i		ນ ປ 7			4.1	4.1	Query Match
926	1236	1099	1622	1009	879	870	539	465	879	1415	844	1347	1100	841	1101	- 4	243	1010	лс	E07	0	921	1201	886	761	1009	1009	9 5 8	1158	1063 2001	1338	1203	1212	935	115	2 Z Z	200	925	932	925	Length
174	90	4.			191	190	23	136	191	94	190	94	190	176	190	190	100	190	100	190 190	190	176	190	176	176	190	190	190	9 4 9	4 6	94	190	94	190	0 4	190 190	190	190	190	190	DB I
AV/31165	BE319582		AW731133	CNS017JA	CNS02QOG	CNS006EZ	AI652297	BE857943	CNS0200G	AW727479	CNS0052P	AW731204	CNS016KD	AZ196416	CNS017SY	CNCOLETO	CNSOLOTE	CNSOLESE	AW/093/2	CNS015Y4	CNS017SY	AZ211117	CNS015Z3	AZ196424	AZ184492	CNSOLOEM	CNSOTOEW	CNSOO4NB	AW727550	AW/2/530	AW731160	CNS015Y4	AW727500	CNS006XK	AW72112/	2W727549	CNS00720	CNS0091P	CNS0072Q	CNS0091P	[D
AW/31165 GABaUU1 AZ186391 SP 1006 B	82 NF(1227 GAEa001	31133 G	2 Drc	•	64271	-	BE857943 7f72f02.x	AL209545 Tetraodon	7479	AL056652 Drosophil	AEa001	Drosophi	AZ196416 SP_1031_B	AL108460 Drosophil			ALIO7180 Drosophil	TITOSDUY.	4 Drosoph		SP_0159_		SP_103	AZ184492 SP_1003_A	AL098882 Drosophil		Ų			GA_	4 Dro	ഖ	AL066051 Drosophil	31134 65	7	0/42		6742	AL053013 Drosophil	Description

ALIGNMENTS

RESULT 1
CNS0091P/c
LOCUS
DEFINITION

ACCESSION VERSION KEYWORDS CNS0091P 925 bp DNA GSS 03-JUN-1999 Drosophila melanogaster genome survey sequence TET3 end of BAC # BACR19D16 of RPCI-98 library from Drosophila melanogaster (fruit fly), genomic survey sequence.
ALD53013
ALD53013 1 GI:4934461
GSS.

Sequencage

(BDGP). part of

```
RESULT
CNS0072Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                           QV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
    ACCESSION
                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                      1080
                                                                                                                                                                                                         613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             960 tccacgtggcctgagctacgccgacgcgacgacggcaccatcaacgcgctgtacagccc 1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                840 ctacgccgccgactgcgcccgctcgccgtgccctctgggcaccgactcggcccagtg 899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial ECORI digestion of Drosophila DNA provided by the BDGP from the isogenic Strain y2; cn bw sp, the same strain used for the BDGP's P1 and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ASSSCGCCGCGMABCCMCSSSSSCCGSASARGVKVRASGGAGKRGGGSGGASASHSSSSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggtcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgga
                                                                                                                                                                                                      cgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatcc 1196
                                                                                                                                                                                                                                                                                           MSAARSSSSSSSSSSSMSASSSASSSSSSSSSSSSSSSGSACGBSMSSGGGSGSVS 614
                                                                                                                                                                                                                                                                                                                                  cgacttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactacagcaa 1139
                                                                                                                                                                                                                                                                                                                                                                                  SSSSCSSSVSCSSVASSMSCSSBSSSSASASSSSSSSSASCASCSCCCTSWSCSCSTSAS 674
                                                                                                                                                                                                                                                                                                                                                                                                                      tcagcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcggcagcgacgccgg 1079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CNS0072Q 932 bp DNA GSS 03-JUN-1999 Drosophila melanogaster genome survey sequence T7 end of BAC # BACR14B09 of RPCI-98 library from Drosophila melanogaster (fruifly), genomic survey sequence.

    Web : www.genoscope.cns.fr)

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Submitted (02-JUN-1999) Genoscope - Centre BP 191 91006 EVRY cedex - FRANCE (E-mail :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Genoscope.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Muscomorpha;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (bases 1 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="end : TET3"
61 c 61 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /clone_lib="RPCI-98"
/clone="BACR19D16"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             . 925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ephydroidea; Drosophilidae; Drosophila
to 925)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         170;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             64.6;
No. 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .8e-05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ς+
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           511 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    National de Sequencage segref@genoscope.cns.fl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  925;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             part of a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      959
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VERSION
KEYWORDS
                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                      δõ
                                                                      밁
                                                                                                           Š
                                                                                                                                                         В
                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                  1194
                                                                                                                                                                                                    1311
                                                                                                                                                                                                                                                                                           1254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1074
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1014 cagccctcagcgctggaagtacctgaccagtggtctgctgggggctgcagcggcggcgg 1073
                           1431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                         769
                                                                                                                                                                                                                                                709
                                                                                                                                                                                                                                                                                                                                      649
                                                                                                                                                                                                                                                                                                                                                                                                                             589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      469
accgctgatcaccttcgacggcacccaacacactgcg 1467
                                                                                                                                                                                      aacgtcgacgccgcaccccgcggcgccggccggggctggccaaggtcgtcgtcgtgttccac
                                                                                                                                                                                                                                                                         cgggcagttcaccggatccgcccc---cgcgatctgtgcgcgctgtggccggtgccggc 1310
                                                                                                                                                                                                                                                CGGSCCGCGCSCSGGCSSCGCSCCCCSCCCCSCCCCSSSGCGGSGGCSSGCGS
                                                                                                                                                                                                                                                                                                                                                           tccagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagcta 1253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGCGCKGCTSKGGCTGBGSTGCGGGGGSKSGSGCSBCCGGGGSTKGGSGGGGGSBSB 588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgccggcgacttgctggtgcttgccgacgactatgacggccgggatgcagacgggcacta 1133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cacccacgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgc 1430
                                                                                                                                                         CGCGSCGGSGCGSCGGCGSSSGCGSSSGSGCGSSSSGSSCGGGSGCSSGCSSGGS
                                                                                                                                                                                                                                                                                                                                      GCGCGCCGCSSGSGGCSSGGSGGSGSGCCGGCSSCGCCSGCCCCSSGCSCCCCCGCGCGS
                                                                                                                                                                                                                                                                                                                                                                                                                           cagcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccga 1193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; cn bw sp, the same strain used for the BDGP's Pland EST libraries. A more detailed description of the library
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           - Web : www.genoscope.cns.fr)
Determination of this BAC-end sequence was carried out.as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha: Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 932)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                collaboration with the Berkeley Drosophila Genome Project The BDGP is constructing a physical map of the Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (02-JUN-1999) Genoscope - Centre BP 191 91006 EVRY cedex - FRANCE (E-mail :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Genoscope.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AL066742.1 GI:4945205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity 33.(
51; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /clone="BACR14B09"
/note="end : T7"
202 c 241 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /clone_lib="RPCI-98"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Drosophila
/db_xref="taxon:7227"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 64.2;
Pred. No. 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    melanogaster"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .6e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             rt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           211;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           243 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         segref@genoscope.cns
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             National de
```

Length 932;

ω

Gaps

1.

708

648

1370

768

828

밁

SCGGCGGSCSGCGSCCCGSSSSSGCCSCGGGCG 925

```
밁
                                          δÃ
                                                                                        В
                                                                                                                           Qy
                                                                                                                                                                          В
                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CNS0091P
                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                     1314 gtcgacgccgcaccccgcggcgccggccggggctggcaaggtcgtcgtggtgtccaccac 1373
                                                                                                              1254 cgggcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaac 1313
                                                                                                                                                                                                           1194 tccagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagcta 125
                                                                                                                                                                                                                                                                                                 1134 cagcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccga 1193
                                                                                                                                                                                                                                                                                                                                                                                     1074 cgccggcgacttgctggtgcttgccgacgactatgacggccggggatgcagacggggcacta 1133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                            675
                                                                                                                                                                                                                                                            Local Similarity 12.7 hes 46; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; cn bw sp, the same strain used for the BDGP's Pland EST libraries. A more detailed description of the library
                                                                                                                                                                          TSASGSGSWSAGGGSGSTGSTSSSSSSSSSTSTSSSSVSSGSKSSTBSSGSBSSSGSSSSS
  SSSSDSTSTCCSCCCYMCTCCSTYBMBCYTSTSCGGSSSSSGKGGVTKCGCGGCGSSSTN
                                                                                      STSSBBSCTSTSSSSSSSYSSSTCSCCTCCCSYSYSSSTSSSSSTSWGSTSGSSSSSYGT
                                                                                                                                                                                                                                                                                                                                                SSGSGYGKGCSSGSGBSCSCCSSCSSSSSSSSCSCCBCCCCSSSSSCCSSSBSSSKCSSTS 614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CNS0091P 925 bp DNA GSS 03-JUN-1999 Drosophila melanogaster genome survey sequence TET3 end of BAC # BACR19D16 of RPCI-98 library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           - BP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (02-JUN-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : segref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha: Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 925)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fly), genomic survey sequence. AL053013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Genoscope
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fruit fly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AL053013.1 GI:4934461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/db_ref="RPCI-98"
/clone="BACR19D16"
/clone="BACR19D16"
/note="end: TET3"
/note="end: TET3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                  4.1%; Score 63.6; DB 190. 12.7%; Pred. No. 0.00013; tive 177; Mismatches 139;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 190; Length 925;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           511 others
                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
    854
                                                                                      794
                                                                                                                                                                        734
                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 4
CNS0072Q/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
AUTHORS
TITLE
γ
                                                                                 Š
                                                                                                                              B
                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VERSION
KEYWORDS
                                              밁
                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LOCUS
                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                          770
                                                                                                                              830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1434 gc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GS -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1435
```

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                  Best Local Similarity 31.6 Matches 128; Conservative
1055 ggctgcagcggcagcgacggcgacttgctggtgcttgccgacgactatgacggcc 1114
                                                                                                                                                                                                                                               1115 gggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccggtgcgtct 1174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPG1-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic Strain y2; cn bw sp, the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library or filters for hybridization from the BACPAC Resource Center can be found at http://Dacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                         atgegeceacaceggeegateeageggeetgggtggeegeegaceaacggateegteagg 1234
                                                                                 Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Drosophila melanogaster genome survey sequence T7 end of BAC's BACR14B09 of RPCI-98 library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (02-JUN-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : segref@genoscope.cns.fl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IIY), genomic survey AL066742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Genoscope
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AL066742.1 GI:4945205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CNS00720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              fruit fly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (bases 1 to 932)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="end : T7"
202 c 241 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Drosophila
/db_xref="taxon:7227"
/clone_lib="RPCI-98"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /clone="BACR14B09"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                            3.9%; Score 61.4; DB 19
31.6%; Pred. No. 0.00042;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     932 bp
                                                                                                                                                                                                                                                                                                                                                                                                                  85;
                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches 192;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   243
                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     932;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  03-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                               771
                                                                                                                                                                                                                                                                                                          831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    914
                                                                                                                                                                                                                                                                                                                                                                                                                  0
```

```
RESULT
CNS004NB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
ORGANISM
                                         Qy
                                                                                       Дb
  Ъ
                                                                                                                           Qy
                                                                                                                                                                                                                                                                                       BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Focus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCESSION
                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1415
                                             1039
                                                                                                                                                                                                                                                                                                                                                                                                                                            source
  525
                                                                                       465
                                                                                                                                  979
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      710
                                                                                                                                                                           Local Similarity
nes 59; Conser
                                                                                                              accagtggtctgctggggctgcagcggcggcggcggggacttgctggtgcttgcc 1098
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCMCCCGCCASCGSCCSCCCYCGBCCCCCCCCCCCCMGCMVGCCMCC 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MAVSVSCCCCCSCCMASCCCCGCVSGCSCCSCSMSCCCCCGCASCVCAGCCMSAGCMGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tcgtcgtggtgtccaccaccacgacgggccactccgtatcagtccggggtagacctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tgtggccggtgccggcaacgtcgacgccgcaccccgcggcgccgggccggggctggcaagg 1354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ASGSRSGSGGAGSGGGGGGSRGSGCGGAVGSASGSSSACSCSASSASSSSSASGCMSCS
                                                                                    SMSSSSACSASASSGCSASSCVAACSSACAGSGASAGSSSSASGSCGAGSSSSAGGSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCCSCGCGSGSGCGSSSCCCGCGCGCCCCCCCCCCGGGCCSGGSCSSCCGCCMCMVAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo. NY. The library is named RPCI-98 and was constructed by partial ECORI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; cn bw sp, the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Web: www.genoscope.cns.fr)

Determination of this BAC-end sequence was carried out as part of collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CNS004NB 839 bp DNA GSS 03-JUN-1999 Drosophila melanogaster genome survey sequence TET3 end of BAC #BACR10E16 of RPCI-98 library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (02-JUN-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : seqref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta;
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AL054280.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Muscomorpha; Ephydroidea; Drosophilidae; Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                fruit fly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 839)
                                                                                                                                                                                                                                                                                                            285
                                                                                                                                                                           Conservative 158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     genomic survey sequence.
                                                                                                                                                                                                                                                                                                                                                /organism="Drosophila m
/db_xref="taxon:7227"
/clone_lib="RPCI-98"
/clone="BACK10E16"
                                                                                                                                                                                                                                                                                                       /note="end : TET3"
67 c 77 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GI:4931788
                                                                                                                                                                                                3.7%;
16.1%;
                                                                                                                                                                                           Score 58;
Pred. No.
                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                     melanogaster"
                                                                                                                                                                                           DB 190;
0.0024;
                                                                                                                                                                                                                                                                                                         27
                                                                                                                                                                           149;
                                                                                                                                                                                                                                                                                                         383
                                                                                                                                                                                                                  Length 839
                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1459
                                                                                                                                                                                                                                                                                                         others
                                                                                                                                                                         0,
                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1414
                                                                                    524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    651
                                                                                                                                                                           0;
```

```
DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
AW727549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                   BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Locus
                                                                                                                                           Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               645
                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gacgactatgacggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaac 1158
; :: ; | : :::::|: ; ; :|:|: ; | | :|: ; | | :|: ; | | | :|: ; | | | :|: ; | | :|: ; | | :|: ; | | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: ; | :|: 
cyccyactycyccoyctcyccyycctyccttctygycaccyactcygcccaytygytcaa 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVVASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gccggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgcgatctgtgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgccg 1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         caacggatccgtcaggtcgccccgttccttagctacgggcagttcaccggatccgccccc 1278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAASAAASSASSAASVVGAACSSGSGASGSSSAGAARARCASVCASSASSGSCSGCSSSM 704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcggtccggtgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgac 1218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSSSSSAASCSSSSSSSSVAAVCSGSGSGVGVSAAAAVARSGARGMGGMGAAGSGRAVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gossypium arboreum
Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Sj
Eukaryota; Viridiplantae; Core eudicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   High quality sequence stop: '
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Clemson University Genomics
Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (2000)
Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        An integrated analysis of the of the cotton fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Leslie, A., Frisch, D., Yu, Y., Wood, T.C., An integrated analysis of the genetics,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       arboreum cDNA clone
AW727549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GA__Ea0012006 Gossypium arboreum 7-10 dpa fiber library Gossypium arboreum cDNA clone GA__Ea0012006, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tel: 864 656 7288 Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             100 Jordan Hall,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gossypium arboreum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AW727549.1 GI:7625105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AW727549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Email: rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Malvales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (bases 1 to 953)
                                                                                                                                                                                                                                                                                               63
                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1344
                                                                                                                                                                                                                                                                                         /lab_host="E. coli"
/note="Vector: pBK-CMV;
382 c 446 g
                                                                                                                                                                                                                                                                                                                                                                                                              /db_xref="taxon:29729"
/clone="GA_Ea0012006"
/clone_lib="Gossypium arboreum
/tissue_type="Fibers isolated f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Gossypium arboreum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Malvaceae; Gossypium.
                                                                                                                                              3.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                953 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Clemson,
                                                                                                                  0;
                                                                                                                                       Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             mRNA
                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SC
                                                                                                                                              57.4; DB 9
No. 0.0034;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        953
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29634, USA
                                                                                                                                                                                                                                                                                            ; Site_1:
62 t
                                                                                                               296;
                                                                                                                                                                      94;
                                                                                                                                                                                                                                                                                                                                                                                                                    from
                                                                                                                                                                                                                                                                                                                                                                                                           from bolls
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Wing, R.A. and Wilkins, T.A. development, and evolution
                                                                                                                                                                                                                                                                                                                           ECORI;
                                                                                                                  Indels
                                                                                                                                                                         Length 953;
                                                                                                                                                                                                                                                                                                                           Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                 fiber library"
s harvested 7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20-APR-2000
                                                                                                         9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and evolution
                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         764
                                                                                                                  2
```

Qy

906

ccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgggatccacg 965

```
RESULT
AW731134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  817
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgacccggccactccgtatcagtccgggg 1405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacgccgcaccccgcggcgcgcgggggctggcaaggtcgtcgtggtgtccaccaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gcagttcaccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggtcaacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agcggcctgggtggccgccgaccgacggtccggtccaggtcgcccgttccttagctacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              accaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggc----cgatcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactacagcaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  agcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcggcagcgacgccggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Contact: Wing RA
Clemson University Genomics I
Clemson University
100 Jordan Hall, Clemson, SC
Tel: 864 656 7288
Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ccecceecceecceecceecceecce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tggcctgagctacg----ccgacgcgacgacgggcaccatcaacgcgctgtacagccctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCGCGCGCGACGCGCCGCCGCCGCGCGCGCGCGCGACCCGGGGCGCGCCCAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AW731134 1315 bp mRNA EST 20-APR-2000 GA_EB0010A03 Gossypium arboreum 7-10 dpa fiber library Gossypium arboreum cDNA clone GA_Ea0010A03, mRNA sequence.

AW731134 GI:7628791 EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of
An
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Leslie,A., Frisch,D., Yu,Y., Wood,T.C., Wing,R.A. and Wilkins,T. An integrated analysis of the genetics, development, and evoluti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gossypium arboreum.
Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Malvales; Malvaceae;
1 (bases 1 to 1315)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    integrated analysis of the genetics, the cotton fiber % \left\{ 1\right\} =\left\{ 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1: rwing@clemson.edu
quality sequence stop:
                                                                                                                                        /db_xref="taxon:29729"
/clone="GA__Ea0010A03"
/clone_lib="Gossypium arboreum 7-10 dpa fiber library"
/tissue_type="Fibers isolated from bolls harvested 7-10"
                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Gossypium
/strain="AKA"
/note="Vector: pBK-CMV;
                                                               /lab_host="E.
                                                                                                                                                                                                                                                                                                                                                                     /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gossypium.
                                                               coli"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        arboreum"
          Site_1:
     EcoRI;
          Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         evolution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               816
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    696
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        456
                                                                                                                                                             7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Þ
```

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                            RESULT 8
CNS006XK/c
                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BASE CO
                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                   REFERENCE
                                                                                                                                                  KEYWORDS
                                                                                                                                                                 VERSION
                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                    DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                       TITLE
                            JOURNAL
                                                      AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                     1191
                                                                                                                                                                                                                                                                                                                               1452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNT
                                                                                                                                                                                                                                                                                                                                                                                                               1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1092
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1032
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       952
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             852 ctgcgcccgctcgccggcctcgccctctgggcaccgactcggcccagtgggtcaaccgcta 911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Sin hes 274;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gttcaacgcggtccggtgcgtctatgcgcccacaccggccgatccagcggcctgggtggc 1211
                                                                                                                                                                                                                                                                                                                   cacccaacacactgcggtg
                                                                                                                                                                                                                                                                                                                                                                                                            CTNCCAGAGCGCTCCCGCG
                                                                                                                                                                                                                                                                                                                                                        CTCCGGCCCCGGCGCCCCCGCGCGCGCGCGCGCGCCACCCTGGCGCCCCGCCGTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                cgccccccgcgatctgtgcgcgctgtggccggttgccggcaacgtcgacgccgcaccccgc 1331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCCCCCACGCCGCCGCCCCCCCCCCCCCCCTCCCGCTCCCCGGTCCCCGCGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gtacctgaccagtggtctgctggggctgcagcgcggcgacgccggcgacttgctggt 1091
                                                                                                                                                                                                                                                                                                                                                                          gtatcagtccggggtagacctggcccgccagctgggcgcaccgctgatcaccttcgacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgccgaccaacggatccgtcaggtcgccccgttccttagctacgggcagttcaccggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcttgccgacgactatgacggccgggatgcaggcgggcactacagcaacgaccaggaccgc 1151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCCCCCCGCCCGGCGGCGGCTGGCCGACCTGCTTCCCGCCGCCCGGCGCCCCGGCCGCCGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gagctacgccgacgcgacgacggccaccatcaacgcgctgtacagccctcagcgctggaa 1031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatccacgtggcct 971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Direct Submission
Submitted (02-JUN-1999) Genoscope - Centre National de Sequencac
BP 191 91006 EVRY cedex - FRANCE (E-mail : segref@genoscope.cns.
Web : www.genoscope.cns.fr)
                                                     Genoscope.
                                                                  Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 935)
                                                                                                                       Drosophila
                                                                                                                                                                            fly), genomic survey sequence. AL066051
                                                                                                                                                                                                    Drosophila melanogaster genome survey sequence T7 end of BACR14N09 of RPCI-98 library from Drosophila melanogaster
                                                                                                                                    fruit fly.
                                                                                                                                                                AL066051.1
                                                                                                                                                                                                                                   CNS006XK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   78
www.genoscope.cns.fr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     D
                                                                                                                       melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3.7%;
                                                                                                                                                                GI:4945019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   O
                                                                                                                                                                                                                                                                                                                             1470
                                                                                                                                                                                                                                 dq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 57.2; DB 9
Pred. No. 0.0038;
0; Mismatches 34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     344;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 1315;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   others
              de Sequencage
enoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1;
                                                                                                                                                                                                                    of BAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               651
```

```
RESULT
AW727500
                                                                                                                                                                                                                                                                                                                                                   БР
                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                      SOURCE
ORGANISM
                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                           ACCESSION
                                                                                                                                                                                               LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                        KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches 117;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1171
                                                                                                                                                                                                                                                                                                                   1471
                                                                                                                                                                                                                                                                                                                                                                                        1411
                                                                                                                                                                                                                                                                                                                                                                                                                                                          1351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1111 ggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccggtgc 1170
                                                                                                                                                                                                                                                                                                                                                                                                                        697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; cn bw sp, the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library, or filters for hybridization from the BACPAC Resource Center can be
                                                                                                                                                                                                                                                                                                               ttcgatggcaaccagtgtgtggactctgcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatccgt 1230
                                                                                                                                                                                                                                                                                SSGSASGCGCGCGMGCRAGSGKMGSAGSSGRCG 545
                                                                                                                                                                                                                                                                                                                                                     CCGCCCSCGCGCGCGCGCCCCCGCCAGCSCASGCSSGMAGVAGSGASRSVVSGGSS
                                                                                                                                                                                                                                                                                                                                                                                  ctggcccgccagctgggcgcaccgctgatcaccttcgacggcacccaacactgcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                      aaggtcgtcgtggtgtccaccaccacgacccggccactccgtatcagtccggggtagac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgccgggccggggctggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGCGCCGSCSCGCCGGCCSGGCCSGGCGGSGCCGSSCCGCSGKSKCGCGCGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              caggicgccccgitccttagctacgggcagitccaccggatccgccccccgcgatctgtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GGSCGGGGGGSSSGSSGCGSGCGSGCGSGSCCCCSGSCCCSCSCGCCSSCSCSCSSSSCCC
                                                                                                                                         AW727500 1212 bp mRNA EST 20-API GA_E80012K04 Gossypium arboreum 7-10 dpa fiber library arboreum cDNA clone GA_E80012K04, mRNA sequence.

AW727500
 Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnollophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Malvaceae; Gossypium.

1 (bases 1 to 1212)
                                                                    Gossypium arboreum
                                                                                                        EST
                                                                                    Gossypium arboreum.
                                                                                                                         AW727500.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone_lib="RPCI-98"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="end : T7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /clone="BACR14N09"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                         GI:7625055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          162 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         56.2; DB 3
                                                                                                                                                                                                                                                                                                                   1503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              others
                                                                                                                                                                                            20-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2;
                                                                                                                                                                         Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                       1410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 816
                                                                                                                                                                                                                                                                                                                                                   578
                                                                                                                                                                                                                                                                                                                                                                                                                      638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    876
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1;
                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                 Вр
                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                         밁
                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρ
                                                                                                   CNS015Y4
                                                                                                                       RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
VERSION
                                                                                        OCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AUTHORS
TITLE
```

```
BASE COUNT
ORIGIN
                                                          DEFINITION
                 ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1007
                                                                                                                                                                                                                                        1367
                                                                                                                                                                                                                                                                                                                                                           1247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1067
                                                                                                                                                                                                                                                                                                  1307
                                                                                                                                                                                                                                                                                                                                                                                                                      1187
                                                                                                                                                                               1427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      482
                                                                                                                                                 896
                                                                                                                                                                                                            840
                                                                                                                                                                                                                                                                       781
                                                                                                                                                                                                                                                                                                                               721
                                                                                                                                                                                                                                                                                                                                                                                        661
                                                                                                                                                                                                                                                                                                                                                                                                                                                   601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                          gcgcaccgctgatcacc 1443
                                                                                                                                                 ccecccccccccccc
                                                                                                                                                                                                                                                                                    cggcaacgtcgacgccgcaccccgcggcgccgggggctggcaaggtcgtcgtggtgt 1366
                                                                                                                                                                                                                                                                                                                                               ttagctacgggcagttcaccgggatccgcccccgcgatctgtgcgcgctgttggccggttgc 1306
                                                                                                                                                                                                                                                                                                                                                                                                        cggccgatccagcggcctgggtggccgccgaccaacggatccgtcaggtcgcccgttcc 1246
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggcactacagcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacac 1186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              606600006606060606000066666009-00006060006666666000066606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gcagcgacgccggcgacttgctggtgcttgccgacgactatgacggccgggatgcagacg 1126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgctgtacagccctcagcgctggaagtacctgaccagtggtctgctgggggctgcagcgcg 1066
                                                                                                                                                                                                            ccaccaccaccaccogccactccgtatcagtccgggtagacctggcccgccagctgg 1426
                                                                                                                                                                                                                                                                    213;
fly), genom
AL106054
AL106054.1
                                         Drosophila melanogaster genome sur
BACN15E10 of DrosBAC library from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Clemson University
100 Jordan Hall, C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Leslie,A., Frisch,D., y_0,y_-, Wood,T.C., Wing,R.A. and Wilkins,T.A. An integrated analysis of the genetics, development, and evolution of the cotton fiber
                                                                        CNS015Y4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Contact: Wing RA
Clemson University Genomics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Email: rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                864 656 7288
864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 quality sequence stop:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97
                             genomic survey sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /lab_host="E. coli"
/note="Vector: pBK-CMV; Site_1:
516 c 454 g 117 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="taxon:29729"
/clone="faA_Ea0012K04"
/clone_lib="Gossypium arboreum
/tissue_type="Fibers isolated f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.6%;
                                                                       1203 bp
                                                                                                                                                 912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 56.2; DB Pred. No. 0.006 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SC 29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            56.2;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Institute
                                        survey sequence T7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .0064;
es 218;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7-10 dpa fiber library"
from bolls harvested 7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    development, and evolution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EcoRI;
28 oth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       others
                                         melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Site_2:
                                                         end
                                                         26-JUL-1999
end of BAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              σ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                           (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              600
                                                                                                                                                                                                                                                                                                                              780
                                                                                                                                                                                                                                                                                                                                                                                       720
                                                                                                                                                                                                                                                                                                                                                                                                                                                   660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
```

```
RESULT 1
AW731160
                                                                                               Š
                                                                                                                        망
                                                                                                                                            δÃ
                                                                                                                                                                      В
                                                                                                                                                                                           Š
                                                                                                                                                                                                                                        Ş
    DEFINITION
                                                                          밁
                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
                  LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
                                                                          1121
                                                                                                                         1061
                                                                                                                                                                       1001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
                                                                                                  425
                                                                                                                                                365
                                                                                                                                                                                                                     941
                                                                                                                                                                                                                                                                                                                   821
                                                                                                                                                                                                                                                                                                                                         125
                                                                                                                                                                                                                                                                                           185
                                                                                                                                                                                                                                                                                                                                                                 761
                                                                                                                                                                                                                                                                                                                                                                                                              701
                                                                                                                                                                                                                                                                                                                                                                                       65
                                                                                                                                                                                                                                                                                                                                                                                                                                     տ
                                                                         ccgctatggcacccgcgatcgccgacacccgacattctccgccacttcgacctggtgggct 424
                                                                                                                                                                                                                                  accaacccggtgggacacaagcgaagttggcggtgatccgcggtccccgcgacgggacagc
                                                                                                                                                                                                                                                                                ccgacaccagcgaaattcgcactgcacgctgcgcgacggtgtcccgtcgccgtcgactacg | :: | :: | :: | :: | :: | :: |
                                                                                              tcgacccgagagggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccg 481
                                                                                                                                                                      gattcggagcactgctggtcaatcctgggggacccggggcgtcggcggtcgacatggtcg 364
                                                                                                                                                                                                                    cccgggtgcgccgtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcg
                                                                                                                                                                                                                                                                                                                                                                gactgctcctagcagcgcccccgttggccggcgactgaagaacccggcgccggccaaa
                                                                                                                                                                                                                                                                                                                                                                                                              AW731160
GA__Ea0010E07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Web: www.genoscope.cns.fr)
Determination of this BAC-end sequence was carried out as part of a collaboration with the European Drosophila Genome Project (EDGP)-http://www.edgp.ebi.ac.uk This Drosophila melanogaster BAC library (Dros BAC) was made by Alain Billaud at CEPH (Centre d'Etude du Polymorphisme Humain) with funding provided by a MRC project grant. The DNA was prepared from embryos by Alain Bucheton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ΒP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Genoscope
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSS.
fruit fly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           pBeloBAC11.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mitted (23-JUL-1999) Genoscope - Centre National de Sequencage
191 91006 EVRY cedex - FRANCE (E-mail : seqref@genoscope.cns.f.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Genevieve Payan. It has been constructed in the vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    154
                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.5%;
ilarity 32.7%;
Conservative 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Drosophila m/plasmid="pBeloBAC11"
/blasmid="pBeloBAC11"
/db_xref="taxon:7227"
/clone_lib="DrosBAC"
/clone="BACN15210"
/note="end : T7"
a 274 c 380 g 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                location/Qualifiers
              1338
  1338 bp
Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 54; DB 1
Pred. No. 0.02;
77; Mismatches
              mRNA
  arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        melanogaster"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    158
   7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ¢
                                                                                                                                                                                                                                                                                                                                                                                                                                                             244;
 dpa
  EST
pa fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 1203;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   segref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
library Gossypium
             20-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                      1060
                                                                                                                                                                                                                    1000
                                                                                                                                                                                                                                                                                                                                                                                      124
                                                                                                                                                                                                                                                                                                                                                                                                              760
                                                                                                                                                                                                                                           304
                                                                                                                                                                                                                                                                   940
                                                                                                                                                                                                                                                                                          244
                                                                                                                                                                                                                                                                                                                 880
                                                                                                                                                                                                                                                                                                                                        184
                                                                                                                                                                                                                                                                                                                                                                820
                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                      Qy
                       Qγ
                                                B
                                                                                               В
                                                                                                                    20
                                                                                                                                               В
                                                                                                                                                                    Ş
                                                                                                                                                                                           ₽
                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                              ρy
  뫄
                                                                                                                                                                                                                                                                                                                                       д
```

```
JOURNAL COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM
                                                                                                                                             1188
                                                                                                                                                                                                                                                                                                                     1008
                                                                                                                                                                                                                                                            1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                         722
                                                                                                                                                                                                                                                                                                                                                                             948
                                                                                                                                                                                                                                                                                                                                                                                                         602
                                                                                                                                                                                                                                 782
                                                                                                                                                                                                                                                                                                                                                   662
                                                                                                                                                                                                                                                                                                                                                                                                                       888 ctcggcccagtgggtcaaccgctaccacgccctggttgacccgctggtgcagaagccggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local
ggcaacgtcgacgccgcaccccgcggcgccgggccggggctggcaaggtcg
                                                                                                                                                                                                                                                                                                         gctgtacagccctcagcgctggaagtacctgaccagtggtctgctggggctgcagcgcgg
                                                       taagacgtcggatccacgtggcctgagctacgccgacggcgacggcgacggcatcaacgc 1007
                                                                                                                ggccgatccagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttcct
                                                                                                                                                                                       gcactacagcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacacc
                                                                                                                                                                                                                                cagogacgcoggogacttgctggtgcttgcogacgactatgacggcogggatgcagacgg 1127
                                                                                                                                                                                                                                                                                         tagctacgggcagttcaccggatccgcccccccgcgatctgtgcgcgctgtggccggtgcc
                                                                                                                                                                                                                                                                                                                                               210;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Leslie, A., Frisch, D., Yu, Y., Wood, T.C., An integrated analysis of the genetics, of the cotton fiber Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     arboreum cDNA clone GA__Ea0010E07, mRNA sequence AW731160 AW731160.1 GI:7628818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Clemson University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
Malvales; Malvaceae; Gossypium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Email: rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    100 Jordan Hall, Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gossypium arboreum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 1338)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            quality sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         864 656 7288
864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="Vector: pBK-CMV; 597 c 619 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /clone="GA__Ea0010E07"
/clone_lib="Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tissue_type="Fibers isolated/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /cultivar="8400"
/db_xref="taxon:29729"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /strain="AKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               'lab_host="E. coli"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 54; DB 9
Pred. No. 0.02;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; Site_1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .02;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                260;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Wing, R.A. an development,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EcoRI; Site_2: 8 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1338;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bolls
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dpa
1071
                           1357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            fiber library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           harvested
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and Wilkins,T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         evolution
                                                                                                                                                                                                                                                                                                                    1067
                                                                                                                                             1247
                                                                                                                                                                        901
                                                                                                                                                                                                                                841
                                                                                                                                                                                                                                                                                                                                                                                                                                   947
                                                       1021
                                                                                                                961
                                                                                                                                                                                                                                                                                         781
                                                                                                                                                                                                                                                                                                                                                  721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7.10
```

```
Š
                                      밁
                                                                      δÃ
                                                                                                            밁
                                                                                                                                             Q
                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                  Дδ
                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  rocus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
1185 accggccgatccagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgtt 1244
                                                                            1125
                                                                                                                                                   1065
                                                                                                                                                                                                                         1007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 source
                                                                                                                                                                                     495
                                                                                                                                                                                                                                                             435
                                                                                                                                                                                                                                                                                                                                      375
                                                                                                                                                                                                                                                                                                                                                                                                           827 ccgctttcaatgactacgccgccgactgcgccgctcgccggcctgccctctgggcaccg 886
                                                                                                                                   cggcagcgacgccggcgacttgctggtgcttgccgacgactatgacggccggggatgcaga 1124
                                                                                                                                                                                                                                                                                                                                  CCCCGCGGGCCGCCGCGCGACCGCCCCCCCGCGGGGGCCCGCGCGCGCGCGCCCTGCGGG 434
                                                                                                                                                                                                                                                                                                                                                                   actoggoccagtgggtcaaccgctaccacgccctggttgacccgctggtgcagaagccgg 946
                                                                    cgggcactacagcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccac 1184
                                                                                                                                                                                     cgctgtacagccctcagcgctggaagtac--ctgaccagtggtctgctgggggctgcagcg 1064
                                    GGCGGGCGCGGGGGCACGGCGCCTGACGCCCCCGCGCCCCCCCGCGCCCCCGCGCCCCC
                                                                                                                                                                                                                                                                                      gtaagacgtcggatccacgtggcctgagctacgccgacgcgacgacggggcaccatcaacg 1006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     269;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Email: rwing@clemson.edu
High quality sequence stop:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Contact: Wing RA
Clemson University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    An integrated analysis of the genetics, development, and evolution of the cotton fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Malvales; Malvaceae; Gossypium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GA_Ea0012M16 Gossypium arboreum 7-10 dpa fiber library Gossypium arboreum cDNA clone GA_Ea0012M16, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 h 3.4%;
Similarity 44.0%;
69; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Leslie, A., Frisch, D., Yu, Y., Wood, T.C., Wing, R.A. and Wilkins, T.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AW727530.1 GI:7625086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 lemson University
lemson University
Hall, Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 1063)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      864 656 7288
864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /lab_host="E. coli"
/note="Vector: pBK-CMV; Site_1: EcoRI; Site_2: XhoI"
514 c 438 g 54 t 3 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /clone="GA_Ea0012M16"
/clone_lib="Gossypium arboreum 7-10 dpa fiber library"
/tissue_type="Fibers isolated from bolls harvested 7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Gossypium arboreum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="taxon:29729"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 53; DB Pred. No. 0.03
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   340;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 1063;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                 554
                                    674
                                                                                                                                                                                                                                                                                                                                                                                                           374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ۲.
```

Db Qy

œ

522 TGCSTCCMYMSSSVSCCSCSGTCCGYCSSCTSCKMCSCTYGCKCGCGCGCSTSCSSSSCC

581

tgtggcgccgcagaccgttgagctcggcgctgctgcttcgggtttgctgctgctcggcggac 67

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 1
CNS006XK
                                                                                                              ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                     BASE COUNT
                                                                                                                                                                                                                                                                                                   FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEFINITION
  Query Match
Best Local S
Matches 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1245
                                                                                                                                                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1305 gccggcaacgtcgacgccgcaccccgcggcgccggccggggctggcaaggtcgtcgtggt 1364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cuncer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; on bw sp. the same strain used for the BDGP's pl and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gggcgcaccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtccaccaccaccaccacceggccactccgtatcagtccggggtagacctggcccgccagct 1424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCGGGCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCGCCCCACCGCCGCGCGCGCGCGCGTCGGCCCCGCGCCCCGGGCCGGGCCGGACGCG 794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cettagetacgggcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggt 1304
    105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Drosophila melanogaster genome survey sequence T7 end of BAC # BACR14N09 of RPCI-98 library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (02-JUN-1999) Genoscope - Centre National de Sequencage : BP 191 91006 EVRY cedex - FRANCE (E-mail : seqref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 935)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fly), genomic survey sequence. AL066051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Genoscope
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AL066051.1 GI:4945019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CNS006XK
                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           fruit fly.
                                                                                                                                        257
  Conservative 109;
                                                                                                                              /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone_lib="RPCI-98"
/clone="BACR14N09"
/clone="BACR14N09"
/note="end: T7"
170 c 162 g 96 t 250
                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               melanogaster
                       3.4%;
25.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   935 bp
                       Score 52.4; DB 190; Pred. No. 0.046;
  Mismatches
  194;
  Indels
                                                                                                                                     others
                                          Length
  0;
Gaps
  0;
```

```
RESULT 14
AW727550/c
  ρy
                                                                                                 BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                   FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FOCUS
                              Query Match
Best Local S
Matches 245
                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                   AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM
                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        882
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  762
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        702
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       128
17 gcagaccgttgagctcggcgctgctgtccttcgggttgctgctcggcggactgctcctag
                              Local Similarity
nes 245; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ctatggcacccgcgatcgccgacaccttctccgccacttcgacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SGSCCGSCGGCGSCCSSGCSCSCSSCSGCGSGGSSCCGSGCGSGCGSGSSGGGSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tcggagcactgctggtcaatcctggggggacccgggggcgtcggcggtcgacatggtcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aacccggtgggacacaagcgaagttggcggtgatccgcgtccccgcgacgggacagcgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCGSGCGSGGGCGSCGSCSSCGCGSGCSSGSSGCSCCSCGSCSSSSGSCCSCGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgggtgcgccggtcgtgccgccaccagagttggaacagctgccgcgagttcatcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SBBSYSTCSCTBCTKCSSGCSTGSGCTGCCGGGGSGCGGCGSGCGCGCGGGGCSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tgctcctagcagcgcccccgttggccggcgactgaagaacccggcgccggccaaaccc
                                                                                                                                                                                                                                                                              Email: rwing@clemson.edu
High quality sequence stop: 1158.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                  Clemson University Genomics Institute Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                       ρħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GA_Ea0012008 Gossypium arboreum 7-10 dr arboreum cDNA clone GA_Ea0012008, mRNA
                                                                                                                                                                                                                                                                                                                                                    100 Jordan Hall,
                                                                                                                                                                                                                                                                                                                                                                                            Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                       Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                Leslie, A., Frisch, D., Yu, Y., Wood, T.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Malvales;
1 (bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gossypium arboreum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AW727550.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AW727550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AW727550
                                                                                                                                                                                                                                                                                                                                                                 lemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                             (bases 1 to 1158)
                                                                                                                                                                                                                                                                                                                                                                                                                       integrated analysis of the the cotton fiber
                                                                                                                                                                                                                                                                                                                        864 656 7288
864 656 4293
                               Conservative
                                                                                                                70
                                                                                                            /lab_host="E. coli"
/note="Vector: pBK-CMV;
530 c 485 g
                                                                                                                                                                  /db_xref="taxon.29729"
/clone="GA_Ea0012008"
/clone_lib="Gossypium arboreum
/tissue_type="Fibers isolated f
                                                                                                                                                                                                                                          /strain="AKA"
                                                                                                                                                                                                                         cultivar-"8400"
                                                                                                                                                                                                                                                    organism="Gossypium arboreum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GI:7625106
                                           3.4%;
                                                                                                                                                                                                                                                                      .1158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1158 bp
                                                                                                                                                                                                                                                                                                                                                    Clemson,
                              0;
                                           Score 52.4; DB 94; Pred. No. 0.047;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   mRNA
                              Mismatches
                                                                                                                                                                                                                                                                                                                                                     SS
                                                                                                                                                                                                                                                                                                                                                    29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                   genetics,
                                                                                                                ; Site_1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EST 20-APR-2000 dpa fiber library Gossypium NA sequence.
                                                                                                                                                                     from b
                                                                                                                                                                                                                                                                                                                                                                                                                                   development,
                                                                                                                                                                                                                                                                                                                                                                                                                                                Wing, R.A. and Wilkins, T.A
                                                                                                              EcoRI; Site_2: 9 others
                              Indels
                                                      Length
                                                                                                                                                                     ) dpa fiber library"
bolls harvested 7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Spermatophyta;
e; eurosids II;
                              0
                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    641
                              0
```

```
RESULT 15
CNS004NB/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LOCUS
                                                                                                                                                                                                                                                                                                                             AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                                                                                                                                                                                                          JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGCCGGGCGGCGGGGGGGCGCNGGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggcagttggcccaggactgtgttgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggcgcgatccgatggccgactacagtccggccggcgtcacccacgtcgaacaggtctacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgtacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCGCGCGCGGCGACCCGGGCGGCCGGCCGGGCCGAGGCGCGGGGCCGGCCGGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccgcgatcgccgacaccgacattctccgccacttcgacctggtgggcttcgacccgagag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tgctggtcaatcctgggggacccggggcgtccggcggtcgacatggtcgccgctatggcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggacacaagcgaagttggcggtgatccgcgcgtccccgcgacgggacagcgattcggagcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCCCGGCGCGCGCGTCGCCGCGCGCGCGCGCGCGCGCGGCCGGCCGGCCGGCCGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cagciococcipttigicoggiogactigaagaaccoggioggioggiogaaaccocgigitigiogi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aaattcgcactgcacgctgcgacggtgtccgtcccgtcgactacgaccaacccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic strain v2: cn bw sp. the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library, or and how to order individual BAC clones, the entire library, or

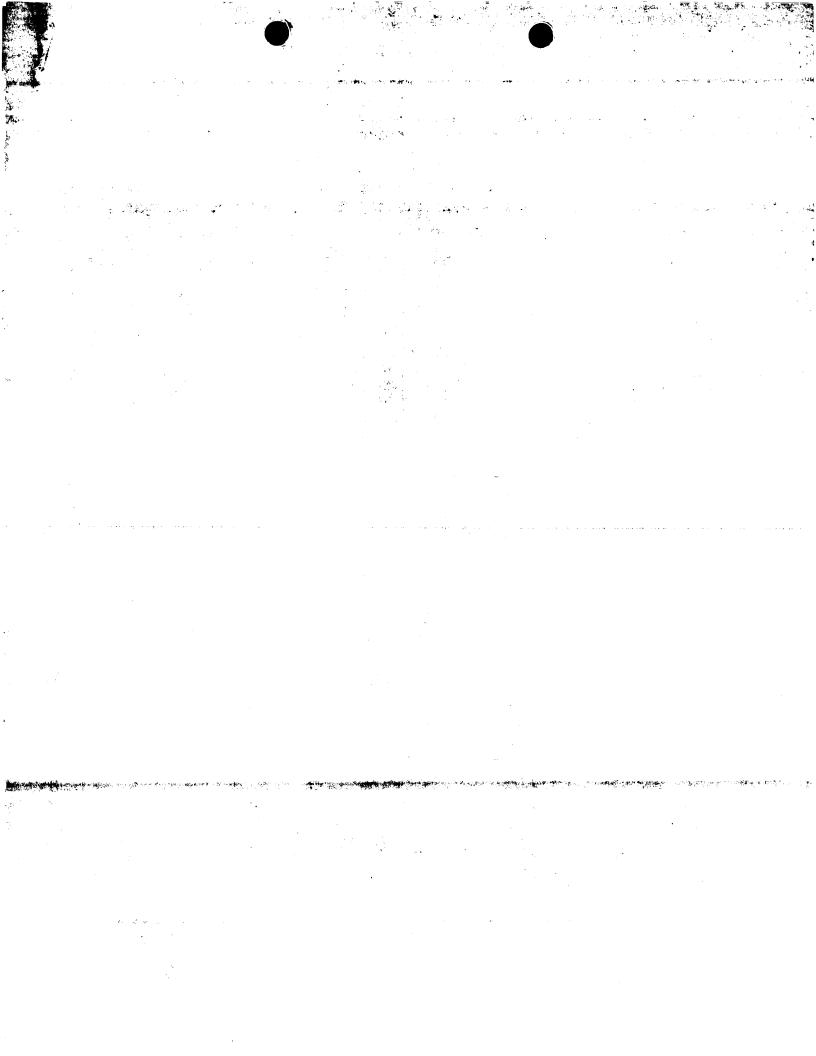
    Web: www.genoscope.cns.fr)
    Determination of this BAC-end sequence was carried out as collaboration with the Berkeley Drosophila Genome Project

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Drosophila melanogaster genome survey sequence TET3 end of BAC #BACR10E16 of RPCI-98 library from Drosophila melanogaster (fruit fly), genomic survey sequence.

AL054280
                                                                                                                                                                                                                                                                                      Submitted (02-JUN-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : segref@genoscope.cns.fl
                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Ins. Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.

1 (bases 1 to 839)
                                                                                                                                                                                                                                                                                                                                                                                                                                              Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                               Genoscope.
                                                                                                                                                                                                                                                                                                                               Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fruit fly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AL054280.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GI:4931788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               584
                                                                                                                                                                                                                                                                                        segref@genoscope.cns.fr
                                                                                                                                                                                                                              (BDGP)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              971
                                                                                                                             of
```

```
В
                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                              Дd
                                                                                                              δÃ
                                                                                                                                                В
                                                                                                                                                                           Qy
                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                          Qy
Search completed: January 12, 2001, 18:01:32 Job time: 21228 sec
                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match 3.3%; Score 52; DB 190; Length 839; Best Local Similarity 16.5%; Pred. No. 0.057; Matches 58; Conservative 148; Mismatches 146; Indels
                                                                                                                                                                                1256
                                                                                                                                                                                                                                                                          1016 gccctcagcgctggaagtacctgaccagtggtctgctgggggctgcagcgggggggcggcgacg 1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                 538
                                                                                                                                                                                                                                                                                                                                                                                                           838 SSCBBTCGSSTBBSCSSCCTSSSSTSSTSSKTGKGCSKSGSBSGSSSSSSSSSGCSTYSS 779
                                                                                                                                                                                                                                                                                                                                            778 STGGSGSSVSGSSGSSBGSSGSGSSGGSSGSSSGSSSGSSGSSGSSGCGGGCS 719
                                                                              SSSGSTTSSSSSSSGSKGCSTSSSSSSTSGTSGSGTSSSCSTSCBTCCGCSCYSCCCCSC 539
                                                                                                                                                                 ggcagttcaccggatccgccccccgcgatctgtgcgcgctgttggccggtgccggcaacgt 1315
::: :||: ::: :| :| :| :| :|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              285 a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/db_xref="RPCI-98"
/clone="BACR10E16"
/clone="BACR10E16"
/note="end: TET3"
67 c 77 g 27 t 383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1. 839
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            383 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
```



```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tal number of hits satisfying chosen parameters:
        118
119
220
221
221
223
224
225
226
227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                         265.2
158.2
158.2
113.2
113.2
113.2
113.2
113.2
165.2
65.2
65.2
52.6
49.2
49.2
49.2
49.2
49.2
49.2
49.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score
        44.4
43.4
43.4
43.4
43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Issued_Patents_NA:*

1: /cgn2_6/ptodata/1,

2: /cgn2_6/ptodata/1,

3: /cgn2_6/ptodata/1,

4: /cgn2_6/ptodata/1,

5: /cgn2_6/ptodata/1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
Match
        117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 117.00 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               280836 seqs, 80580151 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDENTITY_NUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-09-461-774-3
1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 12, 2001, 20:09:43; Search time 153.29 Seconds (without alignments) 1640.094 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version
Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcggccatgtggcgccgcag.....gtctgcggtgcgcgccctga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /cgn2_6/ptodata/1/ina/5A_COMB.seq:*
/cgn2_6/ptodata/1/ina/5B_COMB.seq:*
/cgn2_6/ptodata/1/ina/6_COMB.seq:*
/cgn2_6/ptodata/1/ina/PCTUS_COMB.seq:*
/cgn2_6/ptodata/1/ina/backfiles1.seq:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
        1821
1777
1777
1777
1777
1908
1908
1908
1908
1900
1201
2312
4337
44377
44377
44377
44377
44377
44377
1288
8438
30001
30001
30001
30001
30001
31288
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
20235
202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DВ
US-08-173-508-7
US-08-251-742-7
US-08-251-742-7
US-08-251-742-5
US-08-251-742-5
US-08-251-742-1
US-08-251-742-1
US-08-251-742-1
US-08-251-742-1
US-08-690-473-1
US-08-690-473-1
US-08-690-473-1
US-08-690-473-1
US-08-690-473-1
US-08-680-12-78C-7
US-08-804-12-7C-7
US-08-804-22-7C-7
US-08-804-22-7C-7
US-08-804-22-7C-7
US-08-387-94-2C-1
US-08-439-009A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Description
                                                                                                                                                                                                            sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
                                               Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                  19,
                           Appli
Appli
Appli
Appli
Appli
                                                                                                                                                        Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-173-508-7; Sequence 7, A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Patent No.
GENERAL I
                        FEATURE:
                                                                                FEATURE:
NAME/KEY:
                                                                                                                                                                                         FEATURE:
                                                                                                                                    NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNTRY:
                                                       LOCATION:
  NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                  CDS
104..1720
  mat_peptide
                                                    sig_peptide
104..244
```

000

O

	۵	00 0	ററ
	44 44 5	31 32 33 35 36 36 36	29 30
	41.4 41.4 40.4 40.2 40.2	42.4 42.4 42.4 41.4 41.6 41.6	42.4 42.4
	2.6	2.7777	2.7 2.7
	11219 11219 68750 1269 1269	2097 5467 5467 1862 1862 43280 1659 3946 1833 1833	1052 1052
	μμωωμ	ω N ω ω α ω α ν ⊢ ω	ω 2
ALIGNMENTS	US-07-642-734C-1 US-08-439-009A-1 US-09-335-409-1 US-08-396-218-1 US-08-760-116-1	US-08-941-445A-10 US-07-745-206A-12 US-08-311-363-12 US-08-999-723-1 US-08-999-723-1 US-08-844-427-1 US-08-846-227C-1 US-09-083-351-1 US-09-083-351-1 US-08-403-351-6 US-08-401-646B-6	US-08-403-852D-10 US-08-510-646B-10
	Sequence 1, Appli Sequence 1, Appli Sequence 1, Appli Sequence 1, Appli Sequence 1, Appli		Sequence 10, Appl

SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA: APPLICATION NUMBER: US/08/173,508 FILING DATE: 23-DEC-1993 ATTORNEY/AGENT INFORMATION: 435 ATTORNEY/AGENT INFORMATION: 405 NAME: BENT, Stephen A. REGISTRATION NUMBER: 18740/125/CACO FELECOMMUNICATION INFORMATION: TELEPHONE: 202 672 5300 TELEFAX: 202 672 5300 TELEFAX: 204136 INFORMATION FOR SEQ ID NO: 7: SEQUENCE CHARACTERISTICS: LENGTH: 1820 base pairs TYPE: nucleic acid APPLICANT: Bartfeld, Daniel APPLICANT: Butler, Michael J. APPLICANT: Hadary, Dany APPLICANT: Jenish, David APPLICANT: Krieger, Timothy TITLE OF INVENTION: STREPTOMYCES STITLE OF INVENTION: DALYPEPTIDES TITLE OF INVENTION: POLYPEPTIDES COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS NUMBER OF SEQUENCES: 1 LENGTH: 1820 base pairs TYPE: nucleic acid STRANDEDNESS: double TOPOLOGY: linear SEE: Foley & Lardner: 3000 K Street, N.W. Washington, D.C. Application US/08173508 PROTEASES AND IMPROVED STRAINS FOR EXPRESSION OF PEPTIDES AND

US-08-173-508-7

245..1720

```
Q
                                                 Š
                                                                               밁
                                                                                                       δÃ
                                                                                                                                     밁
                                                                                                                                                                                          망
                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
Q
                            밁
                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 788; Conserv
  1016
                                                                                                                                      1005
                                                                                                                                                                                                                                                                       731
                                                                                                                                                                                                                                                                                                                                                                                                           708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           471
                                                                                                                                                                                                                    791
                                                                                                                                                                                                                                                                                                                                                       765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatc
                                                                                                                                                    actgcgccggctcgccggcctgccctct-----gggcaccgactcggcccagtggg
                                                                                                                                                                                                                                                                                                                                                     tcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                                                                                                                                                                                                                                                                                                                                                                                         tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
gccctcagcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcagcgacg
                            CCGACGGCCGCAAGCTCACCGAATCCCTCGCCACCACCGGCGTGATCGCCGCGATGTACG
                                           GCAAGAACCTCAAGTCCTTCTTCGACGACCTGGACGCGAAGCCCCTGCCCGCCGGCGACG
                                                                                                                                     ACTGCGTGAAGCAGCCGGACTGCCCCCTCGGCGACAAGGACACCACCCCCGACCAGGTCG
                                                                                                                                                                                          GCCGCCTGAACCTGGAGCAGACGGAGGGCTTCGAGACGGCGTTCCAGTCCTTCGCGAAGG
                                                                                                                                                                                                        tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                              teggtactcatgtgegggegatggtcetegaeggegetategateeageegttageeeaa
                                                                                                                                                                                                                                                                                                  AGCTGACCTACGTGGGAGCGTCGTACGGCACCTTCCTGGGCGGCGACCTACGCCGGTCTGT
                                                                                                                                                                                                                                                                                                                agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                                                                                                                                                                                                                           CCTACAAGGAGTTCGCCGAGGGCTGCG--GGGCGGACGCCGAAGCTGCTGCGCC-ACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCCGGGGCGTGGCCCGCAGTGAACCCG---TCGAGTGCCTGGACGGGCGCGCGAGATGGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACGCGGGCATCGGCTACCCGGCGAAGGTCCGCGCCCAGTACGACATGGTGGCGGTCGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tggcacccgcgatcgccgacaccgacattctccgccacttcgacctggtgggcttcgacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCTCGCTGCTGGTCAACCCGGGCGGACCGGGCGGCGGCTCGGCGATCGGCTACCTCCAGCAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gagcactgctggtcaatcctggggggacccggggggttgggtcgacatggtcgccgcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ACGGCGACGTCCGGCTCGCGGTGGCCCGCAAGAAGGCCCACGGGGCCGGGCCAAGCGCCTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggacacaagcgaagttggcggtgatccgc-----gtccccgcgacgggacagcgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AGGCCACGCCCGAGCTGTCCCCCGTACTACGAGCAGAAGCTCGGCTGGCGCGACTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17.0%;
52.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 265.2; DB 1;
Pred. No. 1e-48;
0; Mismatches 678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 1820,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                            944
                                                                                                                                                                                                                                                                                                                                                                                670
                                                                                                                                                                                                                                                                                                                                                                                                                                    610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               290
                                                                                                                                     1064
                                                                                                                                                                                                                                                                                                                                                                                                           764
                                                                                                                                                                                                                                                                                                                                                                                                                                                             707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
```

```
RESULT 2
US-08-265-310-7
Sequence 7, Application US/08265310
; Patent No. 5856166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               덩
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
            SOFTWARE: Patentin Rela
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US
                                                                                                                                                                                                                                                          APPLICANT: Krygsman, Phyllis
APPLICANT: Garven, Shelia
TITLE OF INVENTION: STREPTOMYCES
TITLE OF INVENTION: STREPTOMYCES
TITLE OF INVENTION: POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1185
                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1196
                                                                                                                                                                                                        ADDRESSEE: Foley & L
                                                                                                                                                                                                                                           NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                            COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                       COUNTRY: USA
ZIP: 20007-5109
                                                                                                                                                                      STREET: 3000 K Street, N.W. CITY: Washington, D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTGCGGGCCTGCTGATCCTCCCGACAGCTACTACGAGCGCGAGGCCGACGGCGGCGACA 1304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            actotgoggtgatgoactattttctcgacgggaccttgccgccgacgagtctgcggtgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgctgatcaccttcgacggcacccaacacactgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acgacccggccactccgtatcagtccggggtagaccttggcccgccagct---gggcgcac 1432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcaacgaccaggacgcgttcaacgcggtccggtcggtctatgcgcccacaccggccgatc 1195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACTCCGCGATCAACACGTACCTGCTGACCGGCACCGCCCCGGAGGACGGCAAGCGCTGCT 1718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCTCCTCACCTACGAGGGAGACGGCCACACCGCGTACGGCCGCGGCAGCTCCTGCATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCGACCCGGCCACCCCTACCGCTGGGCCGAGGCCCTCTCCGACCACCTCCGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgacgccgcaccccgcggcgccggcgggctggcaaggtcgtcgtcgtggtgtccaccaccc 1375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaacgt 1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCCCGGACGAGGTGCGCGACGCCCTCCCCGACTTCGAGAAGGCGTCCCCGGTCTTCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccggcgacttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGGAGCCGCACCGCATCGAGGCGGCCGCCGCCCCCGATCGTCGTCGGCACCACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGGGCCTCGCCTGGTCCTCCCTGAAC----TGCGCGTACTGGCCGGTGAAGCCCACGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCAACCTGATGTTCGCCAACGCCGCCGTGAACTGCCTCGACCTCCCCGCCGCCGTCTCTCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1554
                                                 PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                 Walczyk, Eva
                                                                                                                                                                                                                                                                                                                                                                                    Malek, Lawrence
                                                                                                                                                                                                                                                                                                                                                                                                      Jenish, David
Krieger, Timothy
                                                                                                                                                                                                                                                                                                                                                                   Soostmeyer, Gisela
                                                                                                                                                                                                                                                                                                                                                                                                                                       Hadary,
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Butler,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bartfeld, Daniel
                                                                                                                                                                                                            Foley & Lardner
24-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                           Dany
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Michael J
                                                                                                                                                                                                                                               21
              US/08/265,310
                                                                                                                                                                                                                                                                               PROTEASES AND IMPROVED STRAINS FOR EXPRESSION
                                                   #
|-
                                                                                                                                                                                                                                                                                 OF.
                                                                                                                                                                                                                                                                                 PEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1244
                                                                                                                                                                                                                                                                                 ONV
```

CLASSIFICATION:

```
밁
                      Qy
                                                    DЪ
                                                                           Š
                                                                                                       Вb
                                                                                                                          Ωy
                                                                                                                                                       ₽
                                                                                                                                                                            Qy
                                                                                                                                                                                                      В
                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                             DЪ
                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                 рь
                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-265-310-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 1874
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
TELEFAX: 202 672 5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 1821 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LOCATION:
FEATURE:
NAME/KEY:
LOCATION:
FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE: 23-DEC-1993
ATTORNEY/AGENT INFORMATION:
                                                                                                       648
                          611
                                                                                                                                491
                                                                                                                                                                                  431
                                                                                                                                                                                                           531
    765
                                                                                                                                                          591
                                                                                                                                                                                                                                     371
                                                                                                                                                                                                                                                              471
                                                                                                                                                                                                                                                                                      311
                                                                                                                                                                                                                                                                                                                411
                                                                                                                                                                                                                                                                                                                                                                   351
                                                                                                                                                                                                                                                                                                                                                                                                                                              137
                                                                                                                                                                                                                                                                                                                                         257
                                                                                                                                                                                                                                                                                                                                                                                           197
                                                                                                                                                                                                                                                                                                                                                                                                                    291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX: 202 (
TELEX: 904136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
les 788; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   toggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                                                                                                                                                                                                                                                                             ggacacaagcgaagttggcggtgatccgc-----gtccccgcgacgggacagcgattcg
                                                                                                                       cytaccggcgcgatccgatggccgactacagtccggccggcgtcacccacgtcgaacagg
                                                                                                                                                                                                         ACGCGGGCATCGGCTACCCGGCGAAGGTCCGCGCCCAGTACGACATGGTGGCGGTCGACC
                                                                                                                                                                                                                                                                                                                                                                              aaattogcactgcaccgcgcgacggtgtccgtcccgtcgactacgaccaacccggtg
TCTCCACGGTCGAGGCGGCACGCGACATGGACGTCCTGCGCGCGGTGCTGGGGGACGAGA
                                                    CCTACAAGGAGTTCGCCGAGGGCTGCG--GGGCGGACGCGCCGAAGCTGCTGCGCC-ACG
                                                                 tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
                                                                                                                                                                       cyagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacg
                                                                                                                                                                                                                         tggcacccgcgatcgccgacacttctccgccacttcgacctggtgggcttcgacc 430
                                                                                                                                                                                                                                                                          AGGCCACGCCCGAGCTGTCCCCGTACTACGAGCAGAAGCTCGGCTGGCGCGACTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                   cggtcgtggcgccaacagagttggaacagctgcgcgagttcatcgccgacaccagcg
                                                                                                       CCCGGGGCGTGGCCCGCAGTGAACCCG---TCGAGTGCCTGGACGGGCGCGAGATGGACG
                                                                                                                                                                                                                                                            GCTCGCTGCTGGTCAACCCGGGCGGACCGGGCGGCCGATCGGCTACCTCCAGCAGT 530
                                                                                                                                                                                                                                                                                                                                                                 GCGTCCCGGGCTTCCAGTGCGCCACCATGAAGGCCCCGCTCGACTACGCCAAGCCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
104..1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   mat_peptide
245..1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sig_peptide
104..244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    17.0%;
52.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  08/173,508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18740/133/CACO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 265.2; DB Pred. No. 1e-48; 0; Mismatches 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1821;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                       310
                                                                                                                                                                                490
                                                                                                    707
                                                                                                                                                                                                         590
                                                                                                                                                                                                                                                                                                               470
                                                                                                                                                                                                                                                                                                                                                                                                                    350
```

```
RESULT 3
US-08-951-742-7
; Sequence 7, Application
; Patent No. 6127144
; Patent No. 1077144
; GENERAL INFORMATION:
    APPLICANT: Martfeld
; APPLICANT: Michael
                                                                                                                                        멍
                                                                                                                                                                                                   В
                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                         Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                        1719
                                                                                                                                                                                                                                                                                                                                                                                       1479
                                                                                                                                                                                                                                                                                                                                                                                                                                                    1425
                                                                                                                                                                       1553
                                                                                                                                                                                                     1659
                                                                                                                                                                                                                                1493
                                                                                                                                                                                                                                                                1599
                                                                                                                                                                                                                                                                                              1433
                                                                                                                                                                                                                                                                                                                            1539
                                                                                                                                                                                                                                                                                                                                                         1376
                                                                                                                                                                                                                                                                                                                                                                                                                     1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              791
                                                                                                                                        ය
=
                                                                                                                                                                   cg
                                                                                                                                                                                                                     actctgcggtgatgcactattttctcgacgggaccttgccgccgacgagtctgcggtgcg
                                                                                                                                                                                                                                                                                                                       actgcgcccgctcgccggcctgccctct-----gggcaccgactcggcccaqtggg
                                                                                                                                                                                                                                                                                cgctgatcaccttcgacggcacccaacactgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                                                                                                                                                                                                                                                                                                       cgacgccgcaccccgcggcgccggccgggctggcaaggtcgtcgtgtgtccaccaccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggcagttcaccggatccgccccccgcgatctgtgcgcgctgttggccggttgccggcaacgt 1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacg 1255
                                                                                                                                                                                                                                                              GCAACCTGATGTTCGCCAACGCCGCCGTGAACTGCCTCGACCTCCCCGCCGCCTTCTCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gcaacgaccaggacgcgttcaacgcggtccggtctatgcgcccacaccggccgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTGCGGGCCTGCTGATCCTCCCGACAGCTACTACGAGCGCGAGGCCGACGGCGGCTACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ccggcgacttgctggtgcttgccgacgacgtatgacggccggggatgcagacgggcactaca 1135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccctcagcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcgacg 1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cacgtggc-----ctgagctacgccgacgcgacggcggccatcaacgcgctgtaca 1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCAAGAACCTCAAGTCCTTCTTCGACGACCTGGACGCGAAGCCCCTGCCCGGCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                  ACTCCGCGATCAACACGTACCTGCTGACCGGCACCGCCCCGGAGGACGGCAAGCGCTGCT
                                                                                                                                                                                                                                                                                                                                                                                       GGGAGCCGCACCGCATCGAGGCGGCCGGCGCCACCCCGATCGTCGTGGTCGGCACCACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                    AGGGCCTCGCCTGGTCCTCCCTGAAC----TGCGCGTACTGGCCGGTGAAGCCCACGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCCCGGACGAGGTGCGCGACGCCCTCCCCGACTTCGAGAAGGCGTCCCCGGTCTTCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCGACGGCCGCAAGCTCACCGAATCCCTCGCCACCACCGGCGTGATCGCCGCGATGTACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ACTGCGTGAAGCAGCCGGACTGCCCCCTCGGCGACAAGGACACCACCCCCGACCAGGTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCCGCCTGAACCTGGAGCAGACGGAGGGCTTCGAGACGGCGTTCCAGTCCTTCGCUAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         teggtactcatgtgegggegatggteetegaeggegetategateeageegttageeeaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGCTGACCTACGTGGGAGCGTCGTACGGCACCTTCCTGGGCGCGACCTACGCCGGTCTGT
                                                                                                                                       1720
                                                                                                                                                                       1554
                                                                                                                                                                                                                                                                                                                                                                                       1538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1004
```

Application US/08951742

Bartfeld, Daniel Michael J. Butle

Butler

```
FEATURE:
NAME/KEY:
LOCATION:
US-08-951-742-7
                                                          밁
                                                                                      20
                                                                                                                         Вb
                                                                                                                                                       Š
                                                                                                                                                                                         Вр
                                                                                                                                                                                                                    Ş
밁
                         δÃ
                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/951,742
FILING DATE: 16-OCT-1997
ATTORNEY/AGENT INFORMATION:
NAME: Bent, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 0189740/0140
TELECOMMUNICATION INFORMATION:
TELEPHONE: (202)672-5399
TELEPAX: (202)672-5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEX: 904136
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
LENGTH: 1821 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Phyllis Krygsman
APPLICANT: Shella Garren
TITLE OF INVENTION: METHOD FOR EXPRESSION OF PROTEINS
TITLE OF INVENTION: BACTERIAL HOST CELLS
NUMBER OF SEQUENCES: 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MOLECULE TYPE: cDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                           137
                                                                                                                                                                                          231
411
                              257
                                                             351
                                                                                           197
                                                                                                                           291
                                                                                                                                                                                                                                                     / Match 17.0%;
Local Similarity 52.5%;
nes 788; Conservative
                                                                                                                                                                                                                         77
                                                                                                                                                                                                                                                                                                                                                                                                    LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: nucleic acid
STRANDEDNESS: doub
                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                  LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE: Foley & Lardner STREET: 3000 K Street, N.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY:
                                                                                                                                                                                       CCGCGGCCAAGGCGGCGCCGACGGACGCCACGGCGACCCTGCCGA 290
                                                                              aaattcgcactgcacgctgcgcgacggtgtccgtcccgtcgactacgaccaacccggtg
                                                                                                                                                                                                        cagegeceegttggeeggegestgaagaaceeggegeeggeeaaaceeegggtgege 136
ACGGCGACGTCCGGCTCGCCGTGGCCCGCAAGAAGGCCACGGGGCCCGGGCAAGCGCCTCG
                  ggacacaagcgaagttggcggtgatccgc----gtccccgcgacgggacagcgattcg
                                                            GCGTCCCGGGCTTCCAGTGCGCCACCATGAAGGCCCCGCTCGACTACGCCAAGCCCGCCG
                                                                                                                           AGGCCACGCCGAGCTGTCCCCGTACTACGAGCAGAAGCTCGGCTGGCGCGACTGCG
                                                                                                                                                       cggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     D.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Tim Krieger
Lawrence T. Malek
Gisela Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eva Walczyk
                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
104..1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                David Jenish
                                                                                                                                                                                                                                                                                                                                                                                                   sig_peptide
104..244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 linear
                                                                                                                                                                                                                                                                                                                                                    mat_peptide
245..1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7 :
                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                     Score 265.2; DB 3; Pred. No. 1e-48; 0; Mismatches 678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Suite
                                                                                                                                                                                                                                             .2;
le-48;
... 678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          #1.30
                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                      1821
                                                                                                                                                                                                                                                        36;
                                                                                                                                                           196
470
                              310
                                                            410
                                                                                           256
                                                                                                                           350
                                                                                                                                                                                                                                                        8
```

```
Q
                            В
                                                     Ωy
                                                                                  В
                                                                                                            δÃ
                                                                                                                                         밁
                                                                                                                                                                 δõ
                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            γΩ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                         1365
                                                                                                                                                                    1196
                                                                                                                                                                                                1305
                                                                                                                                                                                                                                                     1245
                                                                                                                                                                                                                                                                               1076
                                                                                                                                                                                                                                                                                                            1185
                                                                                                                                                                                                                                                                                                                                                                 1125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1005
                                                                                                                                                                                                                                                                                                                                                                                                                                                 902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          311
                                                                                                                                                                                                                                                                     ccggcgacttgctggttgcttgccgacgactatgacggccggggatgcagacgggcactaca 1135
                                                                                                                                                                                                                                                                                                                                                                                                                                       tcaaccgctaccacgccctggttgacccgctggtgcagaagccggggtaagacgtcggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
acgacccggccactccgtatcagtccggggtagacctggcccgccagct--
                                           cgacgccgcaccccgcgggccgggggctggccaaggtcgtcgtggtgtccaccaccc
                                                                                               ggcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaacgt 1315
                                                                                                                                                       gcaacgaccaggacgcgttcaacgcggtccggtctattgcgcccacacccggccgatc 1195
                                                                                                                                                                                                                                                     GTGCGGGCCTGCTGATCCTCCCGACAGCTACTACGAGCGCGAGGCCGACGGCGGCTACA
                                                                                                                                                                                                                                                                                                                          gccctcagcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcagcgacg
                                                                                                                                                                                                                                                                                                                                                                              cacgtggc-----ctgagctacgccgacgcgacgacggcgccaccatcaacgcgctgtaca 1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagccgitagcccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCTACAAGGAGTTCGCCGAGGGCTGCG--GGGCGGACGCGCGAAGCTGCTGCGCC-ACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tggcacccgcgatcgccgacacccgacattctcgccaccttcgacctggtgggcttcgacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gagcactgctggtcaatcctgggggaccccgggggggtcggcggtcggccattggtcgccgcta
                              GGGAGCCGCACCGCATCGAGGCGGCCGGCGCCACCCCGATCGTCGTGGTCGGCACCACCC
                                                                                   AGGGCCTCGCCTGGTCCTCCCTGAAC-----TGCGCGTACTGGCCGGTGAAGCCCCACGG
                                                                                                                                         GCAACCTGATGTTCGCCAACGCCGCCGTGAACTGCCTCGACCTCCCCGCCGCCTTCTCCT
                                                                                                                                                                                                                                                                                                           CCGACGGCCGCAAGCTCACCGAATCCCTCGCCACCACCGGCGTGATCGCCGCGATGTACG
                                                                                                                                                                                                                                                                                                                                                                                                                     GCAAGAACCTCAAGTCCTTCTTCGACGACCTGGACGCGAAGCCCCTGCCCGGCGGCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCCGCCTGAACCTGGAGCAGACGGAGGGCTTCGAGACGGCGTTCCAGTCCTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGCTGACCTACGTGGGAGCGTCGTACGGCACCTTCCTGGGCGCGACCTACGCCGGTCTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    toggtacogcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCCGGGGCGTGGCCCGCAGTGAACCCG---TCGAGTGCCTGGACGGGCGCGAGATGGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACGCGGGCATCGGCTACCCGGCGAAGGTCCGCGCCCAGTACGACATGGTGGCGGTCGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCTCGCTGCTGGTCAACCCGGGCGGACCGGGCGGCTCGGCGATCGGCTACCTCCAGCAGT
-gggcgcac
                                                         1375
                                                                                     1478
                                                                                                                                          1424
                                                                                                                                                                                                                                                                                                            1244
                                                                                                                                                                                                                                                                                                                                      1075
                                                                                                                                                                                                                                                                                                                                                                 1184
                                                                                                                                                                                                                                                                                                                                                                                                                       1124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   790
                              1.538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                530
                                                                                                                                                                                                                                                                                                                                                                                                                                                  961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         944
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    647
```

```
RESULT 4
US-08-173-508-5
; Sequence 5, Application US/08173508
Patent No. 5616485
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                               US-08-173-508-5
Query Match 10.1%;
Best Local Similarity 49.7%;
Matches 663; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/
FILING DATE: 23-DEC-1993
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: BENT, Stephen A.
                                                                                                                                                                                                                                                         TELEFAX: 202 672 5399
TELEX: 904136
INFORMATION FOR SEQ ID NO: 5
SEQUENCE CHARACTERISTICS:
LENGTH: 1777 base pairs
                                                                                                                                                                                                                                                                                                                      NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 1874
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
TELEFAX: 202 672 5399
                                                                                        FEATURE:

NAME/KEY: misc_feature
LOCATION: 190..192

OTHER INFORMATION: /note
OTHER INFORMATION: repre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ZIP: 20007-5109
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1433
                                                                                                                                                                                                       FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Krieger, Timothy
TITLE OF INVENTION: STREPTOMYCES PROTEASES AND IMPROVED
TITLE OF INVENTION: STREPTOMYCES STRAINS FOR EXPRESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET: 3000 K StreCITY: Washington, I COUNTRY: USA ZIP: 20007-5109
                                                                                                                                                                      NAME/KEY:
LOCATION:
                                                                                                                                                                                                                  TYPE: nucleic acid
STRANDEDNESS: double
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              င္ပ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             сg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          actctgcggtgatgcactattttctcgacgggaccttgccgccgacgagtctgcggtgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCGACCCGGCCACCCCTACCGCTGGGCCGAGGCCCTCTCCGACCACCTCACCTCCGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACCTCCTCACCTACGAGGGAGACGGCCACACCGCGTACGGCCGCGGCAGCTCCTGCATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgctgatcaccttcgacggcacccaacacctgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACTCCGCGATCAACACGTACCTGCTGACCGGCACCGCCCCGGAGGACGGCAAGCGCTGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E: Foley & Lardner 3000 K Street, N.W. ashington, D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bartfeld, Daniel
Butler, Michael J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Jenish, David
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hadary,
                                                                                                                                                                      CDS
190..1731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Dany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POLYPEPTIDES
                                                                                          /note= "Met at position
represents fMet"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US/08/173,508
                                                                                                                                                                                                                                                                                              5
 0,
                                                                                                                                                                                                                                                                                                                                                                          18740/125/CACO
Score 158.2; DB 1;
Pred. No. 8.4e-26;
0; Mismatches 618;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     #1.25
 Indels
                             Length 1777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ΟĘ
 54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PEPTIDES
Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AND
 8,
                                             Ş
                                                                                                                                      밁
                                                                                                                                                                 Q
                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                       Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                Вþ
                                                                            뫄
                                                                                                     QΥ
                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                       1279
                                                                                                                                                                     1108
                1399
                                                                                                          1168
                                                                                                                                                                                                   1222
                                                                                                                                                                                                                                                               1162
                                                                                                                                                                                                                                                                                                                           1102
                                                                                                                                                                                                                                  1048
                                                                                                                                                                                                                                                                                                                                                                                       1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                    1003
                                                                                                                                                                                                                                                                                                                                                        928
                                                                                                                                                                                                                                                                                                                                                                                                                      868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATCTCCTACGGCACCGAACTCGGCGGCGTCTACGCCCATCTGTTCCCCCGAGCACGTGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AGGGGCTGCGAGAA----GGCCGCCGGCAAGCTCATGGAACACGTCTCGACCACGGACACG
                GAGAAGGTCTCCCCGTCTTCGGCGCC----
                                                                                                                                                         gacggccgggatgcagacggcactacagcaacgaccaggacgcgttcaacgcggtccgg
                                                                                                                                                                                                  CTGAAGGCGGCCGAGGAGG---GCGACGGCTCGGAGTTGCTGGCCCTCGCCGACGGCTAC
                                                                                                                                                                                                                     ctgctggggctgcagcgcggcgacgccggcgacttgctggtgcttgccgacgactat 1107
                                                                                                                                                                                                                                                                            acgacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggt 1047
                                                                                                                                                                                                                                                                                                                                                                                                                                                    CAGGCCAGGGGTTTCCAGCGCGCGCGGCTGGACGACTACCTGGAGTCGACCGGCCAGGAACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   caaatggcgggatttcagaccgctttcaatgactacgccgccgactgcgcccgctcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tacagctacggcaccaagttgggcaccgcttacctgggaacggttcggtactcatgtgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              atggccgactacagtccggccggcgtcaccccacgtcgaacaggtctaccggcagttggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gacaccgacattctccgccacttcgacctggttgggcttcgacccgagaggggttcggccac 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cctgggggacccggggcggtcggccgatggtcgccgctatggcacccgcgatcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgctgcgcgacggtgtccgtcccgtcgactacgaccaacccggtgggacacaagcgaag
                                tgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatc
                                                                                                                                       AACGAGCGTGATCCCTCGGGGGCGCTACGGCACGACGACCCACTCGCAAAGGGTCATATCG
                                                                                                                                                                                                                                                               CTGGACGCCGAGCCACTCCCCCGCGGGGGGGGGGGGGGCTGACGCAGACCCTCGCG
                                                                                                                                                                                                                                                                                                                                                     ccgctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcg
                                                                                                                                                                                                                                                                                                                                                                                       GAACAGGGGTCGCGGAAGATCGCCGGCCTG-----
                                                                                                                                                                                                                                                                                                                                                                                                          gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGCGTGATCCTCGACGCGGTGGTGGACCCGGGCGCCGACACGATGGGCCACGCCGAGAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCCCGCGACATGGACCTGATGCGGCACGTCCTGGGCGACGAGGAGGATGCACTACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TCCACGCCGGACTCCCCGGCCGAGGAGCAGGCCTACCTGAAGGACGCCGCCGACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -CCAGCGAGGGCGTCCGCTGCCGCACCGACGAGGCGATCGAGGCCGCCGAGTCGGTGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tegacccetgcgttgceggtgtcgccgacgccgagttcgacgcgtaccggcgcgatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTCTCCTCCTGCACGAGCGGTACGACCTGGTGAGCTGGGACCCGCGCGGGGTGGCCG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTCGGCGGCCCGGCGCCTCCGGCGTCTCCACGATGCC----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CTCGCGCTGATCCGGTCCCGGGCGAGCGGGGACGACCGCATCGGCTCCCTGCTGCTTCAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TGCCTGGACGACAAGCAGAGGCCGACCGTGGAGGAGGAAGAAAGCTGCTGCCGAGGTTC
                -TTCCTCGGCTGGGACACGGCCGGGTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -GTCCTACGCCGACACC
                                                                                                                                                                                                                                                                                                                                                                                     ----CTGGAGCGG
                                                                                                          1227
                                                                                                                                                                                                   1278
                                                                                                                                                                                                                                                                                                                           1161
                                                                                                                                                                                                                                                                                                                                                                                       1101
                                                                                                                                                                                                                                                                                                                                                                                                                                                    1062
                1452
                                                                                                                                       1338
                                                                                                                                                                     1167
                                                                                                                                                                                                                                                               1221
                                                                                                                                                                                                                                                                                                                                                                                                                      927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     474
```

1398

987

867

807

747 882 822 627 765 567 705 507 646

687

В Ω 밁 Š В Q 밁 δÃ 밁 Ş

Gaps

8

270

588

387

```
US-08-265-310-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 5, Application Patent No. 5856166 GENERAL INFORMATION:
                                                                                       TELEFAX: 202 672 5337 TELEX: 904136 INFORMATION FOR SEQ ID NO:
                                                                                                                   REFERENCE/DOCKET NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 18740/133/CACO
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
TELEFAX: 202 672 5399
TELEX: 904124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Garven, TITLE OF INVENTION: TITLE OF INVENTION: TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1573
                                                               SEQUENCE CHARACTERISTICS:
LENGTH: 1777 base pairs
                                                                                                                                                                                                                        APPLICATION NUMBER: US 08/173,508
FILING DATE: 23-DEC-1993
ATTORNEY/AGENT INFORMATION:
NAME: BENT, Stephen A.
                                                                                                                                                                                                                                                                                                                                            SOFTWARE: PatentIn Release #1.0, Version CURRENT APPLICATION DATA: APPLICATION NUMBER: US/08/265,310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQUENCES: 2
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1348
                                                                                                                                                                                                                                                                                          PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1693 AAGGGGACGGTGCCG 1707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1519 gacgggaccttgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: June
CTTY: Washington,
                 STRANDEDNESS:
TOPOLOGY: lir
                                                                                                                                                                                                        NAME: BENT, Stephen A. REGISTRATION NUMBER: 2
                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: FILING DATE: 24-JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | cacactgcggtgttcgatggcaaccagtgtgtggactctgcggtgatgcactattttctc.1518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacctggcccgccagctggg-------gcaccgctgatcaccttcgacggcacccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gycaagytcytcytgytgtcaaccaccacgaccyaccacccytatcaytccygygta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGGATGGCGGACGAGCTGGGCAAGGACGTCGGCGTGCTGACCTGGCAGGGCGAGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TGCCACGACTGGCCGGTGGCCGGTCAGCACGAGACCGCGGAGGTGAGCGCGCCCGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgcgcgctgtggccggtgccggcaacgtcgacgccgcacccccgcgggcgccggcgggggct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CACGGTGCCTACGGGAACGGAAGCGACTGTGTCGACTCCGCGGTGGACGCCTACCTGTTG 1692
                                               nucleic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   E: Foley & Lardner 3000 K Street, N.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Krygsman, Phyl.
Garven, Shelia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Krieger, Timothy
Malek, Lawrence T.
Soostmeyer, Gisela
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Jenish, David
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Walczyk, Eva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Butler, Michael J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bartfeld,
               linear
                                                                                                                                                                                                                                                                                                                              24-JUN-1994
                                 double
                                                   acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STREPTOMYCES
STREPTOMYCES
POLYPEPTIDES
: 21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US/08265310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Phyllis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEASES AND IMPROVED STRAINS FOR EXPRESSION
                                                                                                                                                                                                                                                                                                                                                                                   #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        읁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 : LOCATION: 190..192
; LOCATION: 190..192
; OTHER INFORMATION: /note=;
OTHER INFORMATION: repressure-
                                                                                                                                     밁
                                                                                                                                                                   Ş
                                                                                                                                                                                                        В
                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
Дb
                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                              Ω<sub>γ</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY:
LOCATION:
FEATURE:
NAME/KEY:
LOCATION:
1222
                               1048
                                                                 1162
                                                                                                                                     1102
                                                                                                                                                                                                        1063
                                                                                                                                                                                                                                                                          1003
                                                                                                                                                                       928
                                                                                                                                                                                                                                                                                                            808
                                                                                                                                                                                                                                                                                                                                              943
                                                                                                                                                                                                                                                                                                                                                                                                               883 ATCTCCTACGGCACCGAACTCGGCGCGCGTCTACGCCCCATCTGTTCCCCGAGCACGTGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      211 cgctgcgcgacggtgtccgtcccgtcgactacgaccaacccggtgggacacaagcgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                              688 tacagctacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgg 747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 475 CTCGCGCTGATCCGGTCCCGGGCGAGCGGGGACCGCATCGGCTCCCTGCTGTTCAAC 534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     271 ttggcggtgatccgcgtcccccgcga---cgggacagcgattcggagcactgctggtcgaat 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity nes 663; Conserv
              ctgctggggctgcagcggcgacgccggcggcttgctggtgcttgccgacgactat 1107
                                                                                                                                                                                                                                                                                                                                            CGCGTGATCCTCGACGCGGTGGTGGACCCGGGCGCCGACACGATGGGCCACGCCGAGAAC
CTGAAGGCGGCCGAGGAGG - - -GCGACGGCTCGGAGTTGCTGGCCCTCGCCGACGGCTAC
                                                                                                                                                                                                                                                                                                                                                              gcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acgacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggt 1047
                                                                                                                                                          ccgctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcg
                                                                                                                                                                                                        GAACAGGGGTCGCGGAAGATCGCCGGCCTG-
                                                                                                                                                                                                                                                                                               caaatggcgggatttcagaccgctttcaatgactacgccgccgactgcgccgctcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AGGGGCTGCGAGAA----GGCCGCCGGCAAGCTCATGGAACACGTCTCGACCACGGACACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atggccgactacagtccggccggcgtcaccccacgtcgaacaggtctaccggcagttggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggccac 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTCGGCGGCCCCGGGCGTCTCCGGCGTCTCCACGATGCC-----GTCCTACGCCGACACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cctgggggacccggggcgtcggcggtcgacatggtcgccgctatggcacccgcgatcgcc
                                                                                                                                     gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac
                                                                                                                                                                                                                                                                          CAGGCCAGGGGTTTCCAGCGCGCGCGCTGGACGACTACCTGGAGTCGACCGGCCAGGAACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TCCACGCCGGACTCCCCGGCCGAGGAGCAGGCCTACCTGAAGGACGCCGCCGACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgtaccggcgcgatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTCTCCTCCCTGCACGAGCGGTACGACCTGGTGAGCTGGGACCCGCGCGGGGGTGGCCG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -CCAGCGAGGGCGTCCGCTGCCGCACCGACGAGGCGATCGAGGCCGCCGAGTCGGTGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
190..1731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10.18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Met at position
represents fMet"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 158.2; DB 2;
Pred. No. 8.4e-26;
0; Mismatches 618;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 1777;
                                                                                                                                                                                                        CTGGAGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      54;
```

1101

987

1161

1221

1062

867

927

1002

807 942

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-08-951-742-5
; Sequence 5, Application US/08951742
; Patent No. 6127144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
APPLICATION NUMBER: US/08/951,742
ETILING DATE: 16-OCT-1997
ATTORNEY/AGENT INFORMATION:
NAME: Bent, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 0189740/01.
TELECOMMUNICATION INFORMATION:
TELEPHONE: (202)672-5300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
MEDIUM TYPE: Ploppy disk
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES: 2
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ZIP: 20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STATE: D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAGGGGACGGTGCCG 1707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gacgggaccttgccg 1533
| ||||| |||||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AGGATGGCGGACGAGCTGGGCAAGGACGTCGGCGTGCTGACCTGGCAGGGCGAGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgcgcgctgtggccggtgccggcaacgtcgacgccgcacccccgcggcgcccgggggct 1347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gacggccgggatgcaggcgcgctacagcaacgaccaggacgcgttcaacgcggttccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CACGGTGCCTACGGGAACGGAAGCGACTGTGTCGACTCCGCGGTGGACGCCTACCTGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cacactgcggtgttcgatggcaaccagtgtgtggactctgcggtgatgcactattttctc
ill ill | il
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAGAAGGTCTCTCCCGTCTTCGGCGCC-----TTCCTCGGCTGGGACACGGCCGGGTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AACGAGCGTGATCCCTCGGGGCCCTACGGCACGACGACCCACTCGCAAAGGGTCATATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGCCACGACTGGCCGGTGGCCGGTCAGCCACGAGACCGCGGAGGTGAGCGCGCCCGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E: Foley & Lardner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eva Walczyk
Phyllis Krygsman
Sheila Garven
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gisela Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tim Krieger
Lawrence T. Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           David Jenish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Dany Hadary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bartfeld, Daniel
Michael J. Butler
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             METHOD FOR EXPRESSION OF PROTEINS BACTERIAL HOST CELLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N.W.,
                                                                       0189740/0140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Suite
                                                                                                                                                                                                                                                                                                   Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1452
```

```
Вр
                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; LOCATION: 190...192; OTHER INFORMATION: OTHER INFORMATION: US-08-951-742-5
                                                                                                                                  Qy
                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches 663;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS: LENGTH: 1777 base pairs
                                  1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOLECULE TYPE: cDNA
   928
                                                                                                                                                                    943
                                                                                                                                                                                                                                                                                                        823
                                                                                                                                                                                                                                                                                                                                                                       766
                                                                                                                                                                                                                                                                                                                                                                                                                                     706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         271 ttggcggtgatccgcgtccccgcga---cgggacagcgattcggagcactgctggtcaat 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         211 cgctgcgcgacggtgtcccgtccccgtcgactacgaccaacccggtgggacacaagcgaag 270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         y Match 10.1%;
Local Similarity 49.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: nucleic acid STRANDEDNESS: double TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEFAX: (202)672-5399
TELEX: 904136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME/KEY: misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY:
                                                                                                                                                                                                                                                        tacagctacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgg
ccgctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcg
                                  GAACAGGGGTCGCGGAAGATCGCCGGCCTG---
                                                                                                                       caaatggcgggatttcagaccgctttcaatgactacgccgccgactgcgccgctcgccg
                                                                                                                                                                                    gcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagc
                                                                                                                                                                                                                                      ATCTCCTACGGCACCGAACTCGGCGGCGTCTACGCCCATCTGTTCCCCGAGCACGTGGGC
                                                                                                                                                                                                                                                                                                                        gcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctcgga
                                                                                                                                                                                                                                                                                                                                                                                                  atggccgactacagtccggccggcgtcacccacgtcgaacaggtctaccggcagttggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -CCAGCGAGGGCGTCCGCTGCCGCACCGACGAGGCGATCGAGGCCGCCGAGTCGGTGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgttaccggcgcgatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cctgggggacccggggcgtcggcggtcgacatggtcgccgctatggcacccgcgatcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CTCGCGCTGATCCGGTCCCGGGCGAGCGGGGACGACCGCATCGGCTCCCTGCTTCAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac
                                                                                                    CAGGCCAGGGGTTTCCAGCGCGCGCGGACGACTACCTGGAGTCGACCGGCCAGGAACCC
                                                                                                                                                                    CGCGTGATCCTCGACGCGGTGGTGGACCCCGGGCGCCGACACGATGGGCCACGCCGAGAAC
                                                                                                                                                                                                                                                                                                      GCCCGCGACATGGACCTGATGCGGCACGTCCTGGGCGACGAGGAGGATGCACTACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                       AGGGGCTGCGAGAA - - - GGCCGCCGGCAAGCTCATGGAACACGTCTCGACCACGGACACG
                                                                                                                                                                                                                                                                                                                                                                                                                                     TCCACGCCGGACTCCCCGGCCGAGGAGCAGGCCTACCTGAAGGACGCCGCCGACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTCTCCTCCCTGCACGAGCGGTACGACCTGGTGAGCTGGGACCCGCGCGGGGTGGCCG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TTCGGCGGCCCGGCGCCTCCGGCGTCTCCACGATGCC----GTCCTACGCCGACACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
190..1728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              190..192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               represents fMet"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ū
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 158.2; DB 3
Pred. No. 8.4e-26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches 618;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                -CTGGAGCGG 1101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        447
                                                                                                    1062
                                                                                                                                                                    1002
                                                                                                                                                                                                     807
                                                                                                                                                                                                                                                                    747
                                                                                                                                                                                                                                                                                                      882
                                                                                                                                                                                                                                                                                                                                      687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       646
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         534
                                                                                                                                                                                                                                      942
                                                                                                                                                                                                                                                                                                                                                                                                      627
                                                                                                                                                                                                                                                                                                                                                                                                                                     765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         588
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                            US-08-173-508-1
                                                                                                                                                                                                                                                                                                                                                                                           Sequence 1,
                                                                                                                                                                                                                                                                                                                                                 Patent No. 5616485
GENERAL INFORMATION:
APPLICANT: Bartfe
                                                                                                                                                                                                                                                                                                    APPLICANT:
                                          MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
COMPUTER: IBM PC com
                                                                                                                                                                                                           NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                          TITLE OF INVENTION: TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1162
                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1693 AAGGGGACGGTGCCG
                                                                                                                                    COUNTRY: USA
ZIP: 20007-5109
                                                                                                                                                               STREET: 3000 K Street, CITY: Washington, D.C.
 FILING DATE: 2
CLASSIFICATION:
               APPLICATION NUMBER: US/0 FILING DATE: 23-DEC-1993
                                                                                                                                                                                                ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gacggccgggatgcaggcactacagcaacgaccaggacgcgttcaacgcggtccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gacgggaccttgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgctggggctgcagcgcggcgacgccggcgacttgctggtgcttgccgacgactat 1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CACGGTGCCTACGGGAACGGAAGCGACTGTGTCGACTCCGCGGTGGACGCCTACCTGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGGATGGCGGACGAGCTGGGCAAGGACGTCGGCGTGGTGCTGACCTGGCAGGGCGAGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gacctggcccgccagctggg------cgcaccgctgatcaccttcgacggcacccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGCCACGACTGGCCGGTGGCCGGTCAGCACGAGACCGCGGAGGTGAGCGCGCCCGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tgcgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgccggcgggggct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GAGAAGGTCTCTCCCGTCTTCGGCGCC.----TTCCTCGGCTGGGACACGGCCGGGTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgtcaggtcgcccgttccttagctacgggcagttcaccggatccgccccccgcgatctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGCCTGGACGACAGCAGAGGCCGACCGTGGAGGAGGACGAAGAAGCTGCTGCCGAGGTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgcgtctatgcgcccacaccggccgatccagcggcctgggttggccgccgaccaacggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AACGAGCGTGATCCCTCGGGGGCGCTACGGCACGACGACCCACTCGCAAAGGGTCATATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CTGAAGGCGGCCGAGGAGG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            acgacgaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTGGACGCCGAGCCACGTCCTCGCCGGGGCGGAGCTGACGCAGACCCTCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCCCGGTCCTGGTGGTCGGCAACACGGGCGACCCGGCCACGCCCTACGAGGGCGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                             Application US/08173508
                                                                                                                                                                                E: Foley & Lardner 3000 K Street, N.W.
                                                                                                                                                                                                                                                                                    Krieger, Timothy
                                                                                                                                                                                                                                                                                                  Jenish, David
                                                                                                                                                                                                                                                                                                                  Hadary,
                                                                                                                                                                                                                                                                                                                                 Butler, Michael J.
                                                                                                                                                                                                                                                                                                                                                   Bartfeld, Daniel
                                                                                                                                                                                                                                          STREPTOMYCES
STREPTOMYCES
POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                      Dany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1533
                                US/08/173,508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GCGACGGCTCGGAGTTGCTGGCCCTCGCCGACGGCTAC
                                                                                                                                                                                                                                                         PROTEASES AND IMPROVED STRAINS FOR EXPRESSION
                                                            Version
                                                            #1.25
                                                                                                                                                                                                                                                           QF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1287
                                                                       Š
                                                                                                       DЬ
                                                                                                                                 Š
                                                                                                                                                                В
                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; NAME/KEY:
; LOCATION:
US-08-173-508-1
                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 669;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LOCATION: 146..148
OTHER INFORMATION:
OTHER INFORMATION:
FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY:
LOCATION:
FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 18
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
TELEPAX: 202 672 5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
LENGTH: 1908 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATTORNEY/AGENT INFORMATION: NAME: BENT, Stephen A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURE:
                                                                                                                                                                                                                            493
                                                                                                                                                                                                                                                                                      433
               540
                                                                                                        613
                                                                                                                                                                  553
                                                                                                                                                                                             363
                                                                                                                                                                                                                                                                                                                                                 373
                                                                                                                                   420
                                                                                                                                                                                                                                                        303
                                                                                                                                                                                                                                                                                                                   252
                                                                                                                                                                                                                                                                                                                                                                               192
                                                                                                                                                                                                                                                                                                                                                                                                            317
                                                                                                                                                                                                                                                                                                                                                                                                                                        132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: nucleic acid
STRANDEDNESS: double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: 202 (TELEX: 904136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgtcgaacaggtctaccggcagttggcccaggactgtgttgaccggatgggcttcagctt
                                                                                                                      gggcttcgacccgagaggggtcggccactcgacccttgcgttgcggtgtcgcaccgacgc
                                                                                                                                                                                  cgccgctatggcacccgcgatcgccgac---accgacattctccgccacttcgacctggt
                                                                                                                                                                                                                                                                                                                                                 GAACCTGCCCAAGCCCATCCAGTGCGGCTACGTCACGGTGCCGATGGACTACGCCAAGCC
                                                                                                                                                                                                                                                                                                                                                                            tgcgccggtcgttggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacac 191
                                           GTTCGTCAAGGCACCCAAGGCCGACCCCGTGCCCGGCTCCGAGGCCGACAAGCGCGCCCA
                                                              GGCCCGCGTCACGAACAAGAGCGCGGGTCTGGGCCCAACGCCCAAGGCCTACGACTTCGT
                                                                                                                                                                                                                             GCGCCAGGGCGCCTGATCTACAACCCCGGCGGTCCCGGCGGCTCCGGCCTGCGTTTCCC
                                                                                                                                                                                                                                             gcgattcggagcactgctggtcaatcctgggggacccgggggcgtcggcggtcgacatggt
                                                                                                                                                                                                                                                                                      GTACGGCAAGCAGATCAGGCTCGCCGTCGACCGCATCGGCAACACCGGAACCAGGAGCGA
                                                                                                                                                                                                                                                                                                           cggtgggacacaagcgaagttggcggtgatccgcgtccccgcgacggga-----ca
                                                                                                                                                                                                                                                                                                                                                                                                            GCCGCCGCCGCGCCC----CGGGCGGCATCGACTGGGAGGACTGCGCAGCCGACTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCACTGGTCACCGCCACGCTGATCGCCGGCGCGCGTCTCGGCACCCGCGCGAGCGCCGCC
                                                                                                        CGGCTTCGACCCGCGCGCGTCGGCCACTCCGCGCCCATCTCCTGCGTCGACCCGCAGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
146..1759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        misc_feature
146..148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mat_peptide
263..1756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sig_peptide
146..262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Stephen A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         represents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note= "Met at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29,768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18740/125/CACO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 113.2; DB 1;
Pred. No. 3.7e-16;
0; Mismatches 743;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       at position fMet"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1908;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                      479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    131
```

7;

419 552

612

672

492

302

362

432

```
Sequence 1, Application US/08265310
Patent No. 5856166
GENERAL INFORMATION:
APPLICANT: Bartfeld, Daniel
APPLICANT: Butler, Michael J.
APPLICANT: Hedary, Dany
APPLICANT: Jenish, David
                                                                                                                                                                                                                                                                                                                                                                                             gacgccgcaccccgggggccggggggctggcaaggtcgtcgtggtgtccaccaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgacttgctggtgcttgccgacgactatga---cggccgggatgcagacggggcactacag 1136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCTCGGCGACACCCGCGCGAGGTCCAGGACCAGTGGCTGAAGCTGCGCCGCCGCCGCCGC 1131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggtcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CTTCGAGGGCCGCTGGAAGGACTGGCAGGACTGGGTCGCCGCGAACGACGCCGCCTACCA 1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ctacgccgactgcccgctcgccggcctgcctctgggcaccgactcggcccagtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgctta
                                                                                                                                                                                                                                                                                                                  cgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgct 1436
                                                                                                                                                                                                                                                                                                                                                                      CCCGCTGAACGTGAAGACCGGCAAGGGACTTCCGCCGGTGCTGATCGTCCAGTCCGAGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGCCAACTGGCGCACCTGGGACCGGGACAACACCCGGCTCCACCGGGACCACCCGTTCAT 1431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ageggeetgggtggeegeegaeeaaeggateegteaggtegeeegtteettagetaegg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CTCCGCGGAGAACGCCAACGCCGTCTACACGCCGTCGAGTGCACCGACGCCAAGTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatcc 1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAAGAAGCCGCTGGGCGTCGTCGGACCGGGCCGAGCTGATCTCCTTCTTCCAGAGCGC 1191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GACCTGGGCCAACGCCTGGATGAACCTGCCCTGTGCCACCTGGCCGGTCAAGCAGCAGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcagttcaccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggtcaacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGACACCCAGGCGCTCGTCGACGCCGCCGCACCTGTCCGACACCCGCGGGCAACGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCCGTACTACGACTCCGCCTGGGCGCCGACCGCGGAGATCTTCAGCAAGTACGTCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tccacgtggcctgagctacgccgacgcgacggggcaccatcaacgcgctgtacagccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CCGCGACAAGATCTGGTACCAGGCCAAC-----CTGGACCAGGACGTCGC 1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatga 839
                                                                                                                                                                                                                                                                                               TGACGCCGCCACCCCGTACGAGGGCGCCGTCGAACTGCACCAGCGGTTCCCGGGGATCCCG 1611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCCGCACATGACC---ACGCCGAACACCGCGCGCGCGACCTCGACGTCATCCGCGCCGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCGC----AAGCTCGCCCGCGAGTACGCCGAGGGCTGCTTCGAGCGCAGCGGCGAGATGCT
 David
c, Timothy
                                                                                                                                                                                                                                                                                                                                                                                                                                            1491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    899
                                                                                                                                                                                                                                                                                                                                                                       1551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              959
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    779
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    789
В
                              Qy
                                                                      Вb
                                                                                                       Qy
                                                                                                                                             В
                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                              ; NAME/KEY:
; LOCATION:
US-08-265-310-1
                                                                                                                                                                                                                    Best Local Similarity 46...
Matches 669; Conservative
                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTORNEY AGENT INFORMATION:
NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 1874
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5399
TELEFAX: 202 672 5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/173,508
FILING DATE: 23-DEC-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:
MEDLIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES: 2
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                      FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEFAX: 202
TELEFAX: 904136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
 317
                                                                      257
                                                                                                                                             197
                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY: misc_feature LOCATION: 146.148
OTHER INFORMATION: /notOTHER INFORMATION: repi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NAME/KEY:
LOCATION:
                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ADDRESSEE:
                 tgcgccggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacac 191
                                                                                           cctagcagcgccccgttggccggcgactgaagaacccggcgccggccaaaccccggg ]31
GCCGCCGCCGCGCC----CGGGCGGGCATCGACTGGGAGGACTGCGCAGCCGACTG
                                                                      CCGGCCGACGGCCACGGGCACGGGCGGAGCTGGGACCGGGAGGCGCGGTGCCGATC
                                                                                                                                             GCACTGGTCACCGCCACGCTGATCGCCGGCGCGCGTCTCGGCACCCGCCGCGAGCGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Washington, D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3000 K Street, N.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1908 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Krygsman, Phyllis
Garven, Shelia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
146..1759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Walczyk, Eva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Malek, Lawrence T. Soostmeyer, Gisela
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PatentIn Release #1.0, Version
                                                                                                                                                                                                                                                                                                                               mat_peptide
263..1756
                                                                                                                                                                                                                                                                                                                                                                                     sig_peptide
146..262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Foley & Lardner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          24-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           double
                                                                                                                                                                                                                                   7.3%;
46.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STREPTOMYCES
STREPTOMYCES
                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "Met at
represents fMet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/08/265,310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18740/133/CACO
                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                  Score 113.2; DB 2; Pred. No. 3.7e-16; 0; Mismatches 743;
                                                                                                                                                                                                                                                                                                                                                                                                                                         ; fMet"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROTEASES AND IMPROVED STRAINS FOR EXPRESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #
                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                        1908;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of.
                                                                                                                                                                                                                      40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PEPTIDES
                                                                                                                                                                                                                      Gaps
                                                                      316
                                                                                                                                             256
372
```

Ş

밁

1372 1197

δÃ 밁 Qy QΨ В δÃ DЪ Q В

1080 1192 1132

960

밁

1137

Ş

900

1072

õ

840 967

1012

DЬ δÃ Q

Дb

907 720 847 660

780

δÃ

망 δõ

790 600 밁

밁

Ъ Qy

Š

밁

QΥ

gatcaccttcga 1448

밁

CCTGATCACCGA

7;

RESULT 8 US-08-265-310-1

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
밁
                        δÃ
                                                          В
                                                                                      Ş
                                                                                                                        밁
                                                                                                                                                   δÃ
                                                                                                                                                                                    B
                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                  д
                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                      1192
1372
                                                                                                                                                                                                                                                  1012 CTTCGAGGGCCGCTGGAAGGACTGGCAGGACTGGGTCGCCGCGAACGACGCCGCCTACCA
                                                                                                                                                                                                                                                                                                                                                                                            840 ctacgccgactgcgcccgctcgccctctgggcaccgactcggcccagtg
                                                                                                                                                                                                                                                                                                                                                                                                                                        967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    907
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420 gggcttcgacccgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        373 GAACCTGCCCAAGCCCATCCAGTGCGGCTACGTCACGGTGCCGATGGACTACGCCAAGCC
                          agcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacgg
                                                                              caacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacacccggccgatcc
                                                                                                                                                                                    CCCGTACTACGACTCCGCCTGGGCGCCGACCGCGGAGATCTTCAGCAAGTACGTCGCCGG
                                                                                                                                                                                                                                                                                                                                gytcaaccgctaccacgccctggttgacccgctggtgcagaagccggggtaagacgtcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGCCAACTGGCGCACCTGGGACCGGGACAACACCCGGGCTCCACCGGGACCACCCGTTCAT 1431
                                                            CTCCGCGAGAACGCCAACGCCGTCTACACGCCGTCGAGTGCACCGACGCCAAGTGGCC
                                                                                                                        CGACACCCAGGCGCTCGTCGACGCCGCCGCCCCGACCTGTCCGACACCGCGGGCAACGC
                                                                                                                                           cgacttgctggtgcttgccgacgactatga---cggccgggatgcagacgggcactacag
                                                                                                                                                                                                                 tcagcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcggcggcgg
                                                                                                                                                                                                                                                                             tccacgtggcctgagctacgccgacgcgacgggcaccatcaacgcgctgtacagccc
                                                                                                                                                                                                                                                                                                              CCTCGGCGACACCCGCGCCGAGGTCCAGGACCAGTGGCTGAAGCTGCGCGCCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGCGACAAGATCTGGTACCAGGCCAAC------CTGGACCAGGACGACGTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGGCACCCTCTTCCCGGACCACGTCCGCCGCATGGTCGTCGACAGCGTCGTCAACCCGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgctta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCCGCACATGACC----ACGCCGAACACCGCGCGCGCGACCTCGACGTCATCCGCGCCGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cttggccaatatcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCGC---AAGCTCGCCGCGAGTACGCCGAGGGCTTCGTTCGAGGGGCGAGAGTGCTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTTCGTCAAGGCACCCAAGGCCGACCCCGTGCCCGGCTCCGAGGCCGACAAGCGCGCCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGGCTTCGACCCGCGGCGTCGGCCACTCCGCGCCCATCTCCTGCGTCGACCCGCAGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGCCCGCGTCACGAACAAGAGCGCGGTCTGGGCCCAACACGCCCAAGGCCTACGACTTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgccgctatggcacccgcgatcgccgac---accgacattctccgccacttcgacctggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCGCCAGGGCCCCTGATCTACAACCCCGGCGGTCCCGGCGGCTCCGGCCTGCGTTTCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTACGGCAAGCAGATCAGGCTCGCCGTCGACCGCATCGGCAACACCGGAACCAGGAGCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cggtgggacacaagcgaagttggcggtgatccgcgtccccgcgacggga-----ca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatga
                                                                                                                                                                                                                                                                                                                                                                          1071
                                                                                                                         1311
                                                                                                                                                                                    1251
                                                                                                                                                                                                                   1079
                                                                                                                                                                                                                                                  1191
                                                                                                                                                                                                                                                                               1019
                                                                                                                                                                                                                                                                                                                                                                                                                                        1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           492
                                                            1371
                                                                                                                                                                                                                                                                                                              1131
                                                                                                                                                                                                                                                                                                                                           959
                                                                                                                                                                                                                                                                                                                                                                                                         899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   779
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     251
```

```
RESULT 9
US-08-951-742-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 1, Application US/08951742 Patent No. 6127144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
         FEATURE:

NAME/KEY: misc_feature
LOCATION: 146..148

OTHER INFORMATION: /proc
OTHER INFORMATION: repre
                                                                                                                                                                                                                               TELEFAX: (202)672-539
TELEX: 904136
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/951,742
FILING DATE: 16-OCT-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                            TELECOMMUNICATION INFORMATION: TELEPHONE: (202)672-5300
TELEFAX: (202)672-5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: METHOD FOR EXPRESSION TITLE OF INVENTION: BACTERIAL HOST CELLS NUMBER OF SEQUENCES: 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1257
                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET: July STREET: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1612
                                                                                                                        FEATURE:
                                                                                                                                                                                                                                                                                                                                                    ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1492
                                                                                                                                       MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: PatentIn Release #1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY: USA
ZIP: 20007-5109
                                                                                                                                                                TYPE: nucleic acid
STRANDEDNESS: double
                                                                                                                                                                                                                                                                                                                         NAME: Bent, Stephen A. REGISTRATION NUMBER: 2
                                                                                          LOCATION:
                                                                                                          NAME/KEY:
                                                                                                                                                     TOPOLOGY:
                                                                                                                                                                                                  LENGTH:
                                                                                                                                                                                                                                                                                                            REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCTGATCACCGA 1623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgct 1436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCCGCTGAACGTGAAGACCGGCAAGGGACTTCCGCCGGTGCTGATCGTCCAGTCCGAGCG 1551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gacgccgcaccccgcggccggccgggctggcaaggtcgtcgtggtgtccaccaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gatcaccttcga 1448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGACGCCGCCACCCCGTACGAGGGCGCCGTCGAACTGCACCAGCGGTTCCGGGGGATCCCG 1611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GACCTGGGCCAACGCCTGGATGAACCTGCCCTGTGCCACCTGGCCGGTCAAGCAGCAGAC
                                                                                                                                                                                                  1908 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E: Foley & Lardner
3000 K Street, N.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eva Walczyk
Phyllis Krygsman
Sheila Garven
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Tim Krieger
Lawrence T. Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gisela Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Michael
                                                                                        CDS
146..1756
                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              David Jenish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dany Hadary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Bartfeld,
                                                                                                                                                     linear
                                                                                                                                       CDNA
            represents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Daniel
                            /product= "Met
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Butler
                                                                                                                                                                                                                                                                                                                         29,768
                                                                                                                                                                                                                                 1:
                                                                                                                                                                                                                                                                                                            0189740/0140
, fMet"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Suite
                                                                                                                                                                                                                                                                                                                                                                                                                     Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OF,
                                                                                                                                                                                                                                                                                                                                                                                                                      #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1316
```

```
; FEATURE:
; NAME/KEY:
; LOCATION:
US-08-951-742-1
   밁
                       Q
                                               밁
                                                                   QΥ
                                                                                           В
                                                                                                                Qy
                                                                                                                                          В
                                                                                                                                                            δÃ
                                                                                                                                                                                      В
                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                           γ
                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
Matches 669; Conserv
   1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
NAME/KEY:
                        840
                                                                                                                                                                                                                                                                                                            480
                                                                                              907
                                                                                                                     720
                                                                                                                                                                 660
                                                                                                                                                                                                               600
                                                                                                                                                                                                                                       733
                                                                                                                                                                                                                                                              540
                                                                                                                                                                                                                                                                                      673
                                                                                                                                                                                                                                                                                                                                   613
                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                  553
                                                                                                                                                                                                                                                                                                                                                                                                                               493
                                                                                                                                                                                                                                                                                                                                                                                                                                                     303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       317
                                                                                                                                                                                        790
                                                                                                                                                                                                                                                                                                                                                                                                         363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ctacgccgccgactgcccgctcgccggcctgccctctgggcaccgactcggcccagtg
                                                                                                                                                       aggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgctta
                                                                                                                                                                                        CCCGCACATGACC---ACGCCGAACACCGCGCGCGCGCCCTCGACGTCATCCGCGCCCCT
CTTCGAGGGCCGCTGGAAGGACTGGCAGGACTGGGTCGCCGCGAACGACGCCGCCTACCA 1071
                                                                cgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatga
                                                                                            CGGCACCCTCTTCCCGGACCACGTCCGCCGCATGGTCGTCGACAGCGTCGTCAACCCGTC
                                                                                                                                                                                                                                                   cgtcgaacaggtctaccggcagttggcccaggactgtgttgaccggatgggcttcagctt
                                                                                                                                                                                                                                                                                                                                             999cttcgacccgagagggtcggccactcgacccctgcgttgcggtgtcgcaccgacgc 479
                                                                                                                                                                                                                                                                                                                                                                                                                                          gcgattcggagcactgctggtcaatcctgggggacccggggcgtcggcggtcgacatggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCCGCCGCCGCCGCC----CGGGCGGCCATCGACTGGGAGGACTGCGCAGCCGACTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgcgccggtcgtggcgcgcaacagagttggaacagctgccgcgagttcatcgccgacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCACTGGTCACCGCCACGCTGATCGCCGGCGCGCCGTCTCGGCACCCCGCCGCGAGCGCCGCC 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cctggaacggttcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagc
                                                                                                                                          cttggccaatatcggtaccgcgtcgcacgggacatggacatggttcgccaagcgtt
                                                                                                                                                                                                                                       GCGC----AAGCTCGCCCGAGTACGCCGAGGGCTGCTTCGAGCGCAGCGGCGAGATGCT
                                                                                                                                                                                                                                                                                     GTTCGTCAAGGCACCCAAGGCCGACCCCGTGCCCGGCTCCGAGGCCGACAAGCGCGCCCA
                                                                                                                                                                                                                                                                                                     CGGCTTCGACCCGCGCGCGTCGGCCACTCCGCGCCATCTCCTGCGTCGACCCGCAGGA
                                                                                                                                                                                                                                                                                                                                                                                 GGCCCGCGTCACGAACAAGAGCGCGGTCTGGGCCAACACGGCCAAGGCCTACGACTTCGT
                                                                                                                                                                                                                                                                                                                                                                                             cgccgctatggcacccgcgatcgccgac---accgacattctccgccacttcgacctggt 419
                                                                                                                                                                                                                                                                                                                                                                                                                              GCGCCAGGGCGCCCTGATCTACAACCCCGGCGGTCCCGGCGGCGCCTCCGGCCTTTCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTACGGCAAGCAGATCAGGCTCGCCGTCGACCGCCATCGGCAACACCGGAACCAGGAGCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cggtgggacacaagcgaagttggcggtgatccgggtccccgcgacggga-----ca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAACCTGCCCAAGCCCATCCAGTGCGGCTACGTCACGGTGCCGATGGACTACGCCAAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cctagcagcgccccgttggccggcgactgaagaaccccggcgccggccaaaccccggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7.3%;
nilarity 46.1%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mat_peptide
263..1756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sig_peptide
146..262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 113.2; DB 3; Pred. No. 3.7e-16; 0; Mismatches 743;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1908;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                               659
                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       432
                                               1011
                                                                                                                                                                                        846
                                                                                                                                                                                                                                                                                                                                   672
                                                                                                                                                                                                                                                                                                                                                                                 612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                            US-08-690-473-1
                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                         рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дβ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                          1552
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            900
```

```
Sequence 1, Application US/08690473 Patent No. 5876923 GENERAL INFORMATION:
                                                                                                                                                                                                                                  ZIP: 77210
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy d.
COMPUTER: IBM PC compoperating SYSTEM: PC-ISOFTWARE: Patentin Responses
                                                                                                                                                                                                                                                                                                                                                                             ALL:
STREET: r..
CITY: Houston
CTATE: Texas
TISA
REFERENCE/DOCKET NUMBER: 37,642
TELECOMMUNICATION INFORMATION:
TELEPHONE: 512/418-3000
                                                                         ATTORNEY/AGENT INFORMATION: NAME: Highlander, Steven REGISTRATION NUMBER: 37,6
                                                                                                                                                                                                          CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES: 2
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Leopardi, APPLICANT: Roizman,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1612 CCTGATCACCGA
                                                                                                                                                                                                                                                                                                                                                                          STATE: T
                                                                                                                                          FILING DATE: 26 CLASSIFICATION:
                                                                                                                                                                                       APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCCGCTGAACGTGAAGACCGGCAAGGGACTTCCGCCGGTGCTGATCGTCCAGTCCGAGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacgccgcaccccgcggccgggccggggctggcaaggtcgtcgtggtgtccaccaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agcggcctgggtggccgccgaccgaccgatccgtcaggtcgcccgttccttagctacgg 1256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      caacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatcc 1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggtcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gatcaccttcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TGACGCCGCCACCCGTACGAGGGCGCCGTCGAACTGCACCAGCGGTTCCGGGGATCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgct 1436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaacgtc 1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGACACCCAGGCGCTCGTCGACGCCGCCGCCCGACCTGTCCGACACCGCGGGCAACGC 1311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgacttgctggtgcttgccgacgactatga---cggccgggatgcagacgggcactacag 1136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCCGTACTACGACTCCGCCTGGGCGCCGACCGCGGAGATCTTCAGCAAGTACGTCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAAGAAGCCGCCTGGGCGGCGTCGTCGGACCGGCCGAGCTGATCTCCTTCTTCCAGAGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCTCGGCGACACCCGCGCGAGGTCCAGGACCAGTGGCTGAAGCTGCGCGCCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GACCTGGGCCAACGCCTGGATGAACCTGCCCTGTGCCACCTGGCCGGTCAAGCAGCAGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGCCAACTGGCGCACCTGGGACCGGGACAACACCCGGGCTCCACCGCGACCACCCGCTTCAT 1431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CTCCGCGGAGAACGGCAACGCCGTCTACACGGCCGTCGAGTGCACCGACGCCAAGTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tcagcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcagcgacgccgg 1079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tccacqtggcctgagctacgccgacgcgacgacggccaccatcaacgcgctgtacagccc 1019
                                                                                                                                                                                                                                  PatentIn Release #1.0,
                                                                                                                                                                                                                                                       E: Floppy disk
IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Arnold,
                                                                                                                                                  26-JUL-1996
N: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                              Вох
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1448
                                                                                                                                                                                                                                                                                                                                                                                                                                              4433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HERPES SIMPLEX VIRUS IN INHIBITOR OF APOPTOSIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bernard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 White
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Rosario
                                                                                                                                                                                       US/08/690,473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27
                                                      ARCD: 239
                                                                                                                                                                                                                                         Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ICP4
                                                                                                                                                                                                                                         #
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AS
                                                                                                                                                                                                                                         .
30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1611
```

TELEFAX:

512/474-7577

```
; INFORMATION FOR SEQ ID NO: 1:
; SEQUENCE CHARACTERISTICS:
; LENGTH: 4257 base pairs
; TYPE: nucleic acid
; STRANDEDNESS: single
; TOPOLOGY: linear
US-08-690-473-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                  US-08-458-568A-11/c
                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γ
                                                                                                                                                                                                                                Sequence 11, Application US/08458568A Patent No. 5821339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Similarity Matches 247; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                GENERAL INFORMATION:
                                                                           APPLICANT: Schaffer, Priscilla A.
APPLICANT: Yeh, Lily
APPLICANT: Yeh, Lily
TITLE OF INVENTION: Compositions and Methods for Trea
TITLE OF INVENTION: Infections
NUMBER OF SEQUENCES: 15
CORRESPONDENCE ADDRESS:
ADDRESSEE: Woodcock, Washburn, Kurtz, Mackiewicz &
STREET: One Liberty Place, 46th floor
                                                                                                                                                                                                                                                                                                                                 2895
                                                                                                                                                                                                                                                                                                                                                                1383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                2775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1023
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                 1323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1263
                                                                                                                                                                                                                                                                                                                                                                                                  2835
                 CITY: Philadelphia
STATE: PA
COUNTRY: USA
ZIP: 19103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              843 cgccgccgactgcgccgctcgccctgccctctgggcaccgactcggcccagtgggt 902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         903 caaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatcc 962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               caccggatccgcccccgcgatctgtgcgcgctgtgggcgggtgccggcaacgtcgacgcc 1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caggacgcgttcaacgcggtccggtctatgcgcccacaccggccgatccagcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cttgctggtgcttgccgacgactatgacggccggggatgcagacggggcactacagcaacga 1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcagcgacgccggcga 1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             acgtggcctgagctacgccgacgcgacgacgggcaccatcaacgcgctgtacagccctca 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGACCACCCG 2904
                                                                                                                                                                                                                                                                                                                                                             ggccactccg 1392
                                                                                                                                                                                                                                                                                                                                                                                                                            gcaccccgcggcgccggccggggctggcaaggtcgtcgtggtgtccaccaccacgaccc 1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCCCCGGGCCGCCGCGCAGGCCCCCCCGCGCCCCGTGGCCGTGTCGCCGCCGGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctgggtggccgccgaccaacggatccgtcaggtcgcccgttccttagctacgggcagtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGCCGCCGGGACCTGCTGTTTGACAACCAGAGCCTGCGCCCCCTGCTGGCGGCGGCGGC
                                                                                                                                                                                                                                                                                                                                                                                                CGAGGGCCCCGACCCCTGGGCGGCTGGCGGCGGCAGCCCCGGGGCCCAGCCACACGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4.28;
44.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0; Mismatches 303;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 65.2; DB 2; Pred. No. 7.9e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 4257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                  Treatment
                                                                                                 No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
                                                                                                                                                                  of Herpesvirus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
```

```
Qy
                                                                                                              Ş
                                                                                                                                                      Вb
                                                                                                                                                                                          Ş
                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY: linear
MOLECULE TYPE: DNA (genomic)
HYPOTHETICAL: NO
ANTI-SENSE: NO
ORIGINAL SOURCE:
ORGANISM: Herpes simplex virus
STRAIN: Herpes Simplex Virus Type
US-08-458-568A-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 247; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEFAX: (215) 568-34 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                    4139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Leary Ph.D., Kathryn R.
REGISTRATION NUMBER: 36,317
REFERENCE/DOCKET NUMBER: DFCI-
TELECOMMUNICATION INFORMATION:
TELECHONE: (215) 568-3100
                                                                                                                                                                                                                               4019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4319 CGCCGGGGCCCTGGGCCCCGCGCGCGCGCGCCCTGCCGAGCTCCGCGCCCGC 4260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/065,146
FILING DATE: 05-MAY-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: WordPerfect 5.1 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    843 cgccgccgactgcgcccgctcgccctgccctctgggcaccgactcggcccagtgggt 902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: FILING DATE: 02-JUJ CLASSIFICATION: 43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILING DATE: 05
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEPHONE: (215) 568-3439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDIUM TYPE:
                     caccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggcaacgtcgacgcc 1322
                                                                                                                                                                          ctgggtggccgccgaccaacggatccgtcaggtcgcccgttccttagctacgggcagtt 1262
                                                                                                                                                                                                                                                                                                                                cttgctggtgcttgccgacgactatgacggccgggatgcaggcgggcactacagcaacga 1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acgtggcctgagctacgccgacgcgacgggcaccatcaacgcgctgtacagccctca 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caaccgctaccacgccctggttgacccgctggtgcagaagccgggttaagacgtcggatcc 962
ccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacacccggccgatccagcggc 1202
                                                                                                                                                                                                                                                                                                                                                                                                    gcgctggaagtacctgaccagtggtctgctgggggctgcagcggggggaggcgacggcgg 1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                           CAGCGCACCGGACGCCGACGCGCTGGCGGCCGCCGCCGCCGCCGCCGCCGCCGCGGGA 4140
                                                                           CGAGGGCCCCGACCCCCTGGGCGGCTGGCGGCGGCAGCCCCCGGGGCCCCAGCCACACGGC
                                                                                                                                                      GCCCCGGGCCGCGGCGCAGGCCCGCCCGCGCCCGTGGCCGTGTCGCGCCGGCCCGC
                                                                                                                                                                                                                               GGGGCGCAAGCGCAAGAGTCCCGGCCCGGCCCGGCCGCCGGAGGCGGCCGCCGCGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           E: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  02-JUNE-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4.2%; Score 65.2; DB 1;
44.9%; Pred. No. 9.1e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US/08/458,568A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DFCI-0029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches 303;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 12001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
```

0;

Gaps

0

3780

3900

3840

3960

4080

δÃ

1383 ggccactccg

1392

```
ρy
                                                                                                                                Qy
                                                                                                                                                                 Вр
                                                                                                                                                                                             QΥ
   δõ
                                   В
                                                                                                  뫄
                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 12
US-07-736-178C-1
                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 163; Conserv
                                                                                                                                                                                                                                                                                                                                                                            NAME/KEY:
LOCATION:
5-07-736-178C-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 1, Application US/07736178C Patent No. 5514544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
APPLICANT: Rao, Ramachandra N
APPLICANT: Turner, Jan R
TITLE OF INVENTION: ACTIVATOR GENE FOR MACROLIDE
TITLE OF INVENTION: BIOSYNTHESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INFORMATION FOR SEQ ID NO:
                                                                                                                                                                  1199
                                   1319
                                                                                                                                                                                                                                                       1110 cggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccggtg 1169
                                                                                                    1259
                                                                                                                                                                                                 1170
                                                                                                                                                                                                                                 1139
1350 caaggtcgtcgtggtgtccaccacccacgacccggccactccgtatcagtccggggtaga 1409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELECOMMUNICATION INFORMATION: TELEPHONE: 317-276-3334
TELEFAX: 317-276-1294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTORNEY/AGENT INFORMATION:
NAME: Conrad, Robert A
REGISTRATION NUMBER: 32089
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3779 GGACCACCCG
                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: US
FILING DATE: 19910726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                             TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                                                                    cgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatccg 1229
                                                                                                                                                                                                                              CGCGGCGTGCCGGGCCGAGACCGGCCGGCCCACCTCCGTGGCCCCGGGGGTCTG 1378
                                                       cgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgccgggggctgg 1349
                                                                                                                                                                 GCTCGGGCGCCCGCTCGCCGAGTACGGGACCCTGCGCCCCGTCGCCCCCCACGGAACTGCG 1318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            46285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUCLEIC ACID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indianapolis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2312 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           E: Eli Lilly And Company
Lilly corporate Center
                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                             linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3770
                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA (genomic)
                                                                                                                                                                                                                                                                                                             3.48;
47.08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US/07/736,178C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           <u>--</u>
                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             X8144
                                                                                                                                                                                                                                                                                                             Score 52.6; DB 1;
Pred. No. 0.0037;
                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                              184;
                                                                                                                                                                                                                                                                                                                           Length 2312;
                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                 1258
```

0;

B 8

843 cgccgccgactgcgccgctcgccctgccctctgggcaccgactcggcccagtgggt 902

Matches 261;

Conservative

0;

Mismatches

353;

Indels

0;

Gaps

0;

```
; LOCATION:
US-08-804-227C-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-08-804-227C-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 7, Application US/08804227C Patent No. 5876991
GENERAL INFORMATION:
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE: 317-276-2459 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE OF INVENTION: POLYKETIDE SYNTHASE GENES
MUMBER OF SEQUENCES: 15
CORRESPONDENCE ADDRESS:
ADDRESSEE: THOMAS G. PLANT 1501
STREET: LILLY CORPORATE CENTER
                                                                                                                                                                                                                                                                                                                                                                                                                                            ATTORNEY/AGENT INFORMATION:
NAME: Plant, Thomas, G.
REGISTRATION NUMBER: 35,
                                                                                                                                                                                                                                                                                                                                                                                                               TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1439 CGCGGACCACACCGCCGTCCCCCTGCTCCCGATGGTCGCCCGCACCC 1485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1410 cctggcccgccagctgggcgcaccgctgatcaccttcgacggcaccc 1456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE
                                                                                                                                                 FEATURE:
                                                                                                                                                                            FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                       FEATURE:
                                                                                                                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                                                                                                              MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: FILING DATE: Februa
                                                                                     NAME/KEY:
                                                                                                                  LOCATION:
                                                                                                                                   NAME/KEY:
                                                                                                                                                                                                                       NAME/KEY:
                                                                                                                                                                                                                                                   LOCATION:
                                                                                                                                                                                                                                                                  NAME/KEY:
                                                                                                                                                                                                                                                                                                             TOPOLOGY:
                                                                                                                                                                                                                                                                                                                         STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                     TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OPERATING SYSTEM: MI
SOFTWARE: ASCI(DOS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                               LOCATION:
                                                                                                                                                                                                         LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         46285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INDIANAPOLIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Kuhstoss, Stuart A.
Rosteck, Paul R., Jr.
Sutton, Kimberly L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DeHoff, Bradley S.
                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              E: Floppy disk IBM Compatible
                                                                                                                                                                                                                                                                                                             linear
                                                                                                                  CDS
31329..36071
                                                                                                                                                             CDS
20110..31284
                                                                                                                                                                                                        14046..20036
                                                                                                                                                                                                                                                   CDS
350..14002
                                                                         36155..41830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             February 21,
N: 435
                                                                                                                                                                                                                                                                                                                         single
 3.2%;
42.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US/08/804,227C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Text only
                                                                                                                                                                                                                                                                                                                                                                                                                                             35,784
                                                                                                                                                                                                                                                                                                                                                                                     7 :
                                                                                                                                                                                                                                                                                                                                                                                                                                X-8231
 Score 49.2; DB 2; Pred. No. 0.029;
               Length 44377;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1438
```

```
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 14
US-08-804-198-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 1, Application US/08804198 Patent No. 5945320 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                21189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21729
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     21309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21249
           FILING DATE:
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: CANTRELL, PAUL R.
                                                                                        CURRENT APPLICATION DATA:
APPLICATION NUMBER: US
                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
ADDRESSEE: PAUL R. CANTRELL
                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Rao, Nagaraja R.
APPLICANT: Richardson, Mark A.
APPLICANT: Rosteck, Paul R., Jr.
TITLE OF INVENTION: PLATENOLIDE SYNTHASE
                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                       COMPUTER: Macintosn 7.0 OPERATING SYSTEM: Macintosh 7.0 SOFTWARE: Microsoft Word 5.1
                                                                                                                                                                                                                                                                         STREET: LILLY CORPO
REGISTRATION NUMBER:
                                                                                                                                                                                                                                       COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgctgatcac 1442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggcaacgtcgacgcc 1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgggtggccgccgaccaacggatccgtcaggtcgcccgttccttagctacgggcagtt 1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CATCGGCCACGCCC 21742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cttcgacggcaccc 1456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GACCGCGTCCCCCTCCACCGCGGCCGGGCCGTCGTCCCCCTCCGCGGTGGCCGGGCCGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGGCGGGCCGCTCCCGCCTTCGGCGTCAGCGGCACCAACGCCCACGTCATCATCGA 21488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatccagcggc 1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGCGGGCGCCGTGCAACTGCTCACCGGCGTCCGGCCATGGCCCCCGGCGCGAGCACAGGCC 21428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCAGTCCGAGCTGCCGCGCACCCTGCACGTCGACGCCCTCGGCCAAGGTCGAATGGGA 21368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGGACACCCCAGGCCGCCGGCGGAGCCGCCGGCGTCATCAAGATGGTGCAGGCGTTACG 21308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       acgtggcctgagctacgccgacgcgacggcggcaccatcaacgcgctgtacagccctca 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CACCTACGGCAGTGAACGGGTGGGCGACCCGCTGTGGCTGGGTTCGCTGAAGTCGAACAT 21248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGAACCGCCCGCGGCGGTGACACCTCGCCCGCCGGCGACACCCCCTGAGCCGGGCGAGGC 21548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcagcgacgccggcga 1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   46285
                                                                                                                                                                                                                                                            H
                                                                                                                                                                                                                                                                                              LILLY CORPORATE CENTER
                                                                                                                                                                                                                                         USA
                                                                                                                                                                                                                                                                                                                                                                                                                                         Burgett, Stanley G.
Kuhstoss, Stuart A.
                                                                                          US/08/804,198
                                                                                                                                                                                                                                                                                                                                                                     GENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21608
```

```
Ş
                                                                                                                                      밁
                                                                                                                                                                      Q
                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                          2
                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                 뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ;
US-08-804-198-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches 261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
21669
                                                                   21609
                                                                                                                                      21549
                                                                                                                                                                                                                                                                            21429
                                                                                                                                                                                                                                                                                                                                                21369
                                                                                                                                                                                                                                                                                                                                                                                                                 21309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LOCATION: FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELECOMMUNICATION INFORMATION:
TELEPHONE: 317-276-3885
TECRMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE: DNA (genomic) FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       843 cgccgccgactgcgccgctcgccctgccctctgggcaccgactcggcccagtgggt 902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH: 44377 base pairs TYPE: nucleic acid STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE/DOCKET NUMBER:
ggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgctgatcac
                                                                                    caccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggcaacgtcgacgcc 1322
                                                                                                                                                                                                                              ctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacgggcagtt 1262
                                                                                                                                                                                                                                                                            CCGGCGGGCCGCGTCTCCGCCTTCGGCGTCAGCGGCACCAACGCCCACGTCATCATCGA
                                                                                                                                                                                                                                                                                                ccaggacgcgttcaacgcggtccggttgcgtctatgcgcccacaccggccgatccagcggc
                                                                                                                                                                                                                                                                                                                                                                     cttgctggtgcttgccgacgactatgacggccggggatgcaggggggcactacagcaacga 1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGGACACACCCAGGCCGCCGGCGGAGCCGCCGGCGTCATCAAGATGGTGCAGGCGTTACG 21308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acgtggcctgagctacgccgacgcgacgacggcaccatcaacgcgctgtacagccctca 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CACCTACGGCAGTGAACGGGTGGGCGACCCGCTGTGGCTTGGGTTCGCTGAAGTCGAACAT 21248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       caaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgggttcc 962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGAGGCGCACGGCACCGGCACACCGCTCGGCGACCCGATCGAGGCCGGCGCGCTGATGGC 21188
                                                                   GGAACCGCCGCGGCGGTGACACCTCGCCCGGCGACACCCCTGAGCCGGGCGAGGC
                                                                                                                                                                                                                                                                                                                                              CGCGGGCCCGTGCAACTGCTCACCGGCGTCCGGCCATGGCCCCGGCGCGAGCACAGGCC 21428
                                                                                                                                                                                                                                                                                                                                                                                                                 GCAGTCCGAGCTGCCGCGCACCCTGCACGTCGACGCCCCTCGGCCAAGGTCGAATGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                           gcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcagcgacgccggcga 1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3.2%;
Similarity 42.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
14046..20036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
350..14002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
31329..36071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
20110..31284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        36155..41830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P9113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 49.2; DB 2;
Pred. No. 0.029;
0; Mismatches 353;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       353;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 44377;
```

0;

Gaps

0;

1443 cttcgacggcaccc 1456

21668

21608

밁

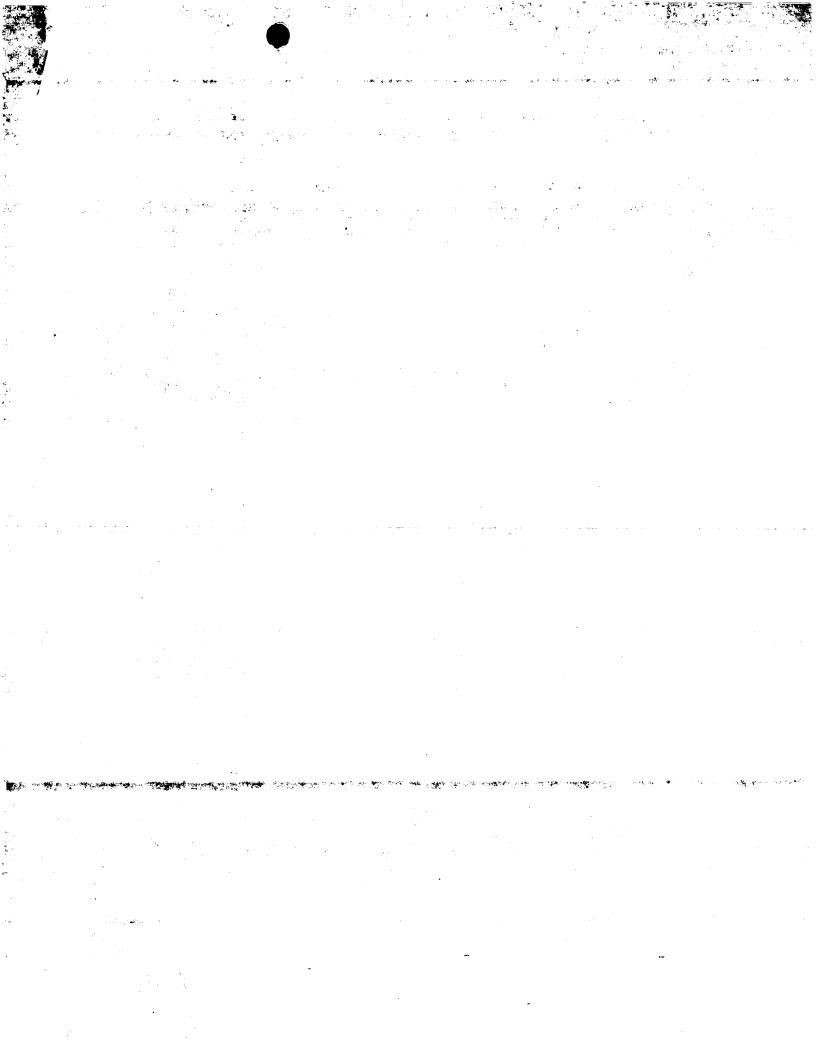
```
Qy
                                                                         Ъ
                                                                                                            δÃ
В
                                                                                                                                                                                                                                                 US-08-804-227C-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 15
US-08-804-227C-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEPHONE: 317-276-2459
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
LENGTH: 43280 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
TOPOLOGY: linear
                                                                                                                                                  Query Match 3.1%; Score 47.6; DB 2; Length 43280; Best Local Similarity 48.9%; Pred. No. 0.064; Matches 128; Conservative 0; Mismatches 134; Indels 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 1, Application US/08804227C Patent No. 5876991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
                                                                       39089 CCGGATCGGCTGGCGGCTGCCGGCTGTGACCGGCGGGCCCGGACCGGCCGCTG 39148
39149 GCTGGTGATCCACCCCGACAGCCCGCGCGCGCGGGAGCTGTCCGGCCACGCCGAACGCGC 39208
                                                                                           1164 ccggtgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgccgaccaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY/AGENT INFORMATION:
NAME: Plant, Thomas, G.
REGISTRATION NUMBER: 35,784
REFERENCE/DOCKET NUMBER: X-8231
TELECOMMUNICATION INFORMATION:
TELEPHONE: 317-276-2459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM Compatible
OPERATING SYSTEM: MS-DOS
SOFTWARE: ASCI(DOS) Text only
CURRENT APPLICATION DATA:
                 1224 gatccgtcaggtcgcccgttccttagctacgggcagttcaccggggatccgcccccgcga 1283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: DeHoff, Bradley S.
APPLICANT: Kubstoss, Stuart A.
APPLICANT: ROSteck, Paul R., Jr.
APPLICANT: Sutton, Kimberly L.
TITLE OF INVENTION: POLYKETIDE SYNTHASE GENES
NUMBER OF SEQUENCES: 15
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                     LOCATION: FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURE:
                                                                                                                                                                                                                                                                                                                          NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                   NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STATE: I
COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: US/08/804,227C FILING DATE: February 21, 1997 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ADDRESSEE: THOMAS G. PLANT 1501
STREET: LILLY CORPORATE CENTER
CITY: INDIANAPOLIS
                                                                                                                                                                                                                                                                                                                                                                                    LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                           NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                        NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  USA
                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
14351..19945
                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                          CDS
31232..36067
                                                                                                                                                                                                                                                                                                                                                                                  CDS
20010..31199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
816..14234
                                                                                                                                                                                                                                                                   36249..41774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA (genomic)
                                                                                                                                                  0;
                                                                                                                                                Gaps
```

1223

0;

```
QΥ
                                                                                                   Q
                                                                                                                                        Ъ
                                                                                                                                                                      QΥ
 Вb
                                                                     DЬ
39329 CGCGCCCGTGGCCGGTGTGCTG 39350
                                                                                                                                        39209 GCTGCGCGCGGGGCGCGAGCCCCGTACCGCTGCCCGTGGACGCTCCGGCCGCCGACCG 39268
                                                                     39269
                   1404 ggtagacctggcccgccagctg 1425
                                                                                                      1344
                                                                                                                                                          ggctggcaaggtcgtcgtggtgtccaccacccaccgacccggccactccgtatcagtccgg 1403
                                                                     GGCGTCCTTCGCGGCACTGCGCTCCGCCACCGGACCTGACACGAGGTGACACACGC 39328
```

Search completed: January 12, 2001, 20:12:43 Job time: 26431 sec



```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           otal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on:
                SIDS6/gcgdata/geneseq/geneseqn/NA1980.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1981.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1981.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1982.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1985.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1985.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1985.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:

SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IDENTITY_NUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-461-774-3
1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480022 segs, 187831343 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 gcggccatgtggcgccgcag.....gtctgcggtgcgcgccctga 1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                January 12, 2001, 20:01:03;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            _Geneseq_36:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Search time 244.98 Seconds (without alignments) 2392.170 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   960044
```

SUMMARIES

11 12	c 9	7 8	ი თ	4 ω	2	Result No.
58.4 52.6	63.6	65.2 65.2	113.2 113.2	158.2 155	265.2 265.2	Score
3.7 114955 20 X53491 3.4 2312 14 Q35141	16 20	4.2 4257 19 V68520 4.2 4257 19 V10362		1777 20 1777 16	1821 16 1821 20	Query Match Length DB ID
Human adenosine Al srmR coding sequen	HSV L/ST region. Human adenosine Al	The nucleotide sequence infected cell prot	S. lividans protea Tripeptidyl aminop	Clone P8-2 encodin S. lividans protea	S. lividans protea Clone P5-6 encodin	Description

Bartfeld D,

Butler MJ, Hadary D,

Jenish DL,

Krieger TJ;

		O	ი	C			O								C				ဂ	C	O										a	O
45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
43		43	43			43.2	ω.	ω		43.8	44	44	44	44	44	44.2	44.8	4.5	CD	45.2	€.	6	46.8	46.8	47.6	47.6	47.6	8	49.2	49.2	50	50
2.8		٠	٠			•				2.8				•				2.9		٠				3.0						3.2		
2787	1321	1167	1167	77536	2614	1976	29879	3336	2929	13842	38506	37948	36778	11220	10732	53789	77536	12588	30001	30001	8438	4093	4050	3222	43280	15872	15872	26338	44377	44377	24379	37
21	21	19	14	21	11	20	14	13	19	21	21	21	21	21	21	19	21	15	20	18	15	19	19	19	18	21	18	19	18	18	19	18
Z87302	A37128	T76908	Q41760	A14651	Q06631	Z28095	Q46806	Q23759	V62384	Z87297	256001	Z87285	Z87318	Z87298	A10594	V21187	A14651	Q63293	X05110	T61016	Q73500	V62381	V62379	V62382	T80413	287283	T68715	V62134	T80414	- 1	V25925	
nezuelae	Human PRO1781 (UNO	Human oxytocin rec	Oxytocin receptor	eotide sequ	onferri	-	eryA region of S.	Gene encoding acul	B. subtilis wild-t	S. venezuelae macr	Recombinant cosmid	S. venezuelae pik	S. venezuelae pik	venezuelae ma		Amycolatopsis medi		uence encodi	S. aureofaciens DN	Total DNA sequence	DNA encoding Pseud	ECB	B. subtilis ECB de	B. subtilis ECB de	Ľ	ത	ven	$\overline{}$		S		Streptomyces freno

ALIGNMENTS

```
Key
                                                                                                                                                    Protease; metalloendoproteinase; tripeptidyl aminopeptidase; protease-deficiency; protein secretion; ds.
                                                                                                                                                                        S. lividans protease P5-6 gene.
                                                                                                                                                                                      04-DEC-1995
                                                                                                                                                                                                    Q99366;
                                                                                                                                                                                                                Q99366 standard; DNA; 1821 BP
                          23-DEC-1993;
                                       22-DEC-1994;
                                                   29-JUN-1995
                                                                W09517512-A
                                                                                         mat_peptide
                                                                                                      sig_peptide
                                                                                                                                        Streptomyces lividans.
             (CANG-) CANGENE CORP.
                                                                                                                                                                                      (first entry)
                         93US-0173508
                                       94WO-US14772
                                                                                          /*tag= a
104..244
/*tag= b
245..1720
                                                                              /product= P5-6.
                                                                                                                    Cocation/Qualifiers
                                                                                    /*tag=
```

```
Š
                                            밁
                                                                 Ş
                                                                                         В
                                                                                                           δ
                                                                                                                                      Д
                                                                                                                                                       Q
                                                                                                                                                                               Вр
                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Protease Tap-negative cells were transformed with a S. lividans 66 genomic library and screened with ARA-beta-naphthylamide to isolate colonies contg. genes (09365-68) for novel proteases P5-4, P5-6, P5-10 and P8-2 (R80505-08). Impaired expression of such proteases by Streptomyces hosts improves the quality, quantity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Endogenous Streptomyces protease(s), opt. having impaired activity useful in prodn. of exogenous proteins with reduced proteolytic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Malek
 885
                                                                                                                                                               551
                                                                                                                                                                                    648
                                                                                                                                                                                                          491
                                                                                                                                                                                                                                  591
                                                                                                                                                                                                                                                        431
                                                                                                                                                                                                                                                                             531
                                                                                                                                                                                                                                                                                                    371
                                                                                                                                                                                                                                                                                                                            471
                                                                                                                                                                                                                                                                                                                                                                        411
                                                                                                                                                                                                                                                                                                                                                                                                257
                                                                                                                                                                                                                                                                                                                                                                                                                       351
                                                                                                                                                                                                                                                                                                                                                                                                                                              197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                231
                                                                                         765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            stability
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cagcgccccgttggcgggcgcactgaagaacccggcgccggccaaaccccgggtgcgc
         tcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagccgttagcccaa
                                                       agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                      tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
                                                                                                                                                                                                 cgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacc
                                                                                                                                                                                                                                                                            acgcgggcatcggctacccggcgaaggtccgcccagtacgacatggtggcggtcgacc
                                                                                                                                                                                                                                                                                                                                       acggcgacgtccggctcgcggtggcccgcaagaaggccacggggcaagcgcctcg
                                                                                                                                                                                                                                                                                                                                                                                                                                  cggtcgtggcgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
                                                                                                                                                                                                                                 cccggggcgtggcccgcagtgaacccg---tcgagtgcctggacggggggagatggacg
                                                                                                                                                                                                                                                                                         tggcacccgcgatcgccgaccacgaccattcgcccacttcgacctggtgggcttcgacc
                                                                                                                                                                                                                                                                                                                          gctcgctgctggtcaacccgggcggaccgggctcggctacgctacctccagcagt
                                                                                                                                                                                                                                                                                                                                                                                    ggacacaagcgaagttggcggtgatccgc-----gtccccgcgacgggacagcgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                      gcgtcccgggcttccagtgcgccaccatgaaggccccgctcgactacgccaagcccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aggccacgccgccgagctgtccccgtactacgagcagaagctcggctggcgactgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ccgcggccaaggcggccggcgacggaggcggccacggcgaccctgaccccctgccga
tctccacggtcgaggcggcacgcgacatggacgtcctgcgcgcggtgctgggcgacgaga
                                                                                                                                      cctacaaggagttcgccgagggctgcg--gggcggacgcgcaagctgctgcgcc-acg
                                                                                                                                                                                   788;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fig.14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         142pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            exogenous gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     283 A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17.0%;
52.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ر<sub>0</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Walcyzk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 265.2; DE Pred. No. 2e-44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            products
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     <u>ი</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Τ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      other
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                    430
                                                                                                                                                                                                                                                                                                                            530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           196
                                                                                                                670
                                                                                                                                      764
                                                                                                                                                               610
                                                                                                                                                                                    707
                                                                                                                                                                                                                                  647
                                                                                                                                                                                                                                                        490
                                                                                                                                                                                                                                                                             590
                                                                                                                                                                                                                                                                                                                                                                         470
                                                                                                                                                                                                                                                                                                                                                                                                                                            256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              80
```

QΥ 밁 Š 밁 Š B δÃ Вþ Ş 밁 Qy В Qy В δÃ 멍 Qy В Qy 밁 Qy 밁 QY 망 Q

밁 δÃ Вb

Clone P5-6

encoding an aminopeptidase

designated

inal cleavage; protein production; tumour necrosis factor; TNF:

19-MAR-1999

(first

entry)

V84068; V84068

standard;

DNA;

1821

Tripeptidyl aminopeptidase; TAP; N-terminal cleavage; GM-CSF; interleukin-3; IL-3; IL-6; EPO; tumour necros: SCF; IL-7; IL-2; P5-6; SlpD; ds.

Streptomyces

lividans

```
RESULT
V84068
                                                                                  1719
                                                                                                                                                                                                    1493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1425
                                                                                                                      1553
                                                                                                                                                              1659
                                                                                                                                                                                                                                              1599
                                                                                                                                                                                                                                                                                                                            1539
                                                                                                                                                                                                                                                                                                                                                                    1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                    1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  945
                     N
                                                                             cg
                                                                                                                   çg
                                                                                                                                                                                 actctgcggtgatgcactattttctcgacgggaccttgccggcgacgagtctgcggtgcg
                                                                                                                                                                                                                                                                                                                                               acgacccggccactccgtatcagtccggggtagaccttggcccgccagct---gggcgcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ggcagttcaccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggcaacgt 1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cagcggcctgggtggccgccgaccaacggatcccgtcaggtcgccccgttccttagctacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcaacgaccaggacgcgttcaacgcggtccggtcgtctatgcgcccaccaccggccgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccggcgacttgctggtgcttgccgacgacgtatgacggccggggatgcagacgggcactaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   actgcgcccgctcgccctct------gggcaccgactcggcccagtggg
                                                                                                                                                         actoogogatoaacacgtacctgctgaccggcaccgccccggaggacggcaagcgctgct
                                                                                                                                                                                                                                         acctecteacctacgagggagacggccacaccgcgtacggccgcgggcagctcctgcatcg
                                                                                                                                                                                                                                                                 cgctgatcaccttcgacggcacccaacactgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                                                                                                                                                                                                                       gcgacccggccacccctaccgctgggccgaggccctctccgaccagctcacctccggcc
                                                                                                                                                                                                                                                                                                                                                                                                        gggagccgcaccgcatcgaggcggccggccaccccgatcgtcgtggtcggcaccaccc
                                                                                                                                                                                                                                                                                                                                                                                                                             cgacgccgcaccccgcgggcgccggcggggctggcaaggtcgtcgtcgtgtgtccaccaccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        agggcctcgcctggtcctccctgaac-----tgcgcgtactggccggtgaagcccacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccccggacgaggtgcgacgccctccccgacttcgagaaggcgtccccggtcttcggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gcaacctgatgttcgccaacgccgccgtgaactgcctcgacctccccgccgccttctcct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gtgcgggcctgctgatcctctccgacagctactacgagcgcgaggccgacggcggctaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    acgagggcgcctggcagcagctgcgcgagtccctcacctcggcgatcaaggagaaggacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gccctcagcgctggaagtacctgaccagtggtctgctgggggctgcagcggcgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccgacggccgcaagctcaccgaatccctcgccaccaccggcgtgatcgccgcgatgtacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cacgtggc----ctgagctacgccgacgcgacgacgggcaccatcaacgcgctgtaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gcaagaacctcaagtccttcttcgacgacctggacgcgaagcccctgcccgccggcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                actgcgtgaagcagccggactgccccctcggcgacaaggacaccaccccccgaccaggtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccgcctgaacctggagcagacggagggcttcgagacggcgttccagtccttcgcgaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                  1720
                                                                                                                      1554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1075
                                                                                                                                                                                                                                                                                    1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1064
                                                                                                                                                                                                                                                                                                                              1598
                                                                                                                                                                                                                                                                                                                                                                    1432
                                                                                                                                                                                                                                                                                                                                                                                                            1538
                                                                                                                                                                                                                                                                                                                                                                                                                                                    1375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            901
```

```
SACCCCCCXXS
              Qy
                                         Ъ
                                                             δõ
                                                                                          В
                                                                                                             Qy
                                                                                                                                         В
                                                                                                                                                                    δÃ
                                                                                                                                                                                               Дb
                                                                                                                                                                                                                   γ
                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                     qq
                                                                                                                                                                                                                                                                                                                                                       Best Local Similarity Matches 788; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                          The present sequence encodes an aminopeptidase designated SlpD. The specification also describes a tripeptidyl aminopeptidase (TAP) of Streptomyces. The aminopeptidase is endogenous to Streptomyces and cleaves an N-terminal sequence of X-Pro-Y, where X is an aliphatic or hydroxy amino acid and Y is an aliphatic, hydroxy or sulphur-containing amino acid. The TAP of Streptomyces are useful in the production of proteins, such as GM-CSF, interleukin-3 (IL-3), IL-6, EPO, tumour necrosis factor (TNF) SCF, IL-7 and IL-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Streptomyces
N-terminal pr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 1821 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Krieger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bartfeld
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (CANG-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-JUN-1994;
23-DEC-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   05-JAN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US5856166-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mat_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sig_peptide
                 431
                                                                                            471
                                                                                                                     311
                                                                                                                                              411
                                                                                                                                                                      257
                                                                                                                                                                                                 351
                                                                                                                                                                                                                           197
                                                                                                                                                                                                                                                     291
                                                                                                                                                                                                                                                                                                                               77
                                                                                                                                                                                                            aaattcgcactgcacgctgcgcgacggtgtccgtcccgtcgactacgaccaacccggtg
                                                                                                                                                                                                                                                                 cggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
                                                                                                                                                                                                                                                                                                                  1999-105117/09
 cgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacg
                                        acgcgggcatcggctacccggcgaaggtccgcccagtacgacatggtggcggtcgacc
                                                                                                      gagcactgctggtcaatcctgggggacccgggggcgtcggcggtcgacatggtcgccgcta
                                                                                                                                                          ggacacaagcgaagttggcggtgatccgc----gtccccgcgacgggacagcgattcg
                                                    tggcacccgcgatcgccgacacccgacattctccgccacttcgaccttggtgggcttcgacc
                                                                                           gctcgctgctggtcaacccgggcggaccgggctcggctacctccagcagt
                                                                                                                                            acggcgacgtccggctcgcggtggcccgcaagacggccacggggccaagcgcctcg
                                                                                                                                                                                               gcgtcccgggcttccagtgcgccaccatgaaggccccgctcgactacgccaagcccgccg
                                                                                                                                                                                                                                                  aggccacgccgccgagctgtccccgtactacgagcagaagctcggctggcgcgactgcg
                                                                                                                                                                                                                                                                                                    ccgcggccaaggcggccggcgacggacggccacggcgaccctgaccccctgccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŢĮ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W87799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CANGENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      es tri:peptidyl aminopeptidase - uspro-peptide from secreted proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Fig 25A-C;
                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Butler MJ,
Krygsman P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94US-0265310
93US-0173508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           94US-0265310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /*tag= b
245..1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product=
104..244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                      283 A; 715 C; 602 G; 221 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                   17.0%;
52.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ψ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             83pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Garven
Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protease
                                                                                                                                                                                                                                                                                                                                                       Score 265.2; DB Pred. No. 2e-44; 0; Mismatches 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Soostmeyer
                                                                                                                                                                                                                                                                                                                                                        678;
                                                                                                                                                                                                                                                                                                                                                                                ĎВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    useful
                                                                                                                                                                                                                                                                                                                                                                                20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Jenish
r G, Wa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Walczyk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DL;
                                                                                                                                                                                                                                                                                                                                                       36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ħ
                                                                                                                                                                                                                                                                                                                                                       Gaps
                490
                                                                                                                                              470
                                                                                                                                                                                                                                                                             196
                                                                                                                                                                                                                                                                                                     290
                                         590
                                                                                                                                                                                                                          256
                                                                                                                                                                                                                                                   350
                                                                                                                                                                                                                                                                                                                                                        8
                        Qy
                                                                           Qy
                                                                                                                           QΥ
                                                                                                                                                         밁
                                                                                                                                                                                Qy
                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                              DЪ
                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                        QY
                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
  밁
                                                     밁
                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
  1659
                                                                                                                                                          1479
                                                                                                                                                                                                             1425
                                                                                                                                                                                                                                       1256
                                                                                                                                                                                                                                                               1365
                                                                                                                                                                                                                                                                                                                 1305
                                                                                                                                                                                                                                                                                                                                                                   1245
                                                                                                                                                                                                                                                                                                                                                                                                                      1185
                                                                                                                                                                                                                                                                                                                                                                                                                                                1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1125
                          1493
                                                                                                                                                                                                                                                                                                                                                                                              1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            591
actccgcgatcaacacgtacctgctgaccggcaccgccccggaggacggcaagcgctgct
                actctgcggtgatgcactattttctcgacgggaccttgccgccgacgagtctgccggtgcg
                                                                 cgctgatcaccttcgacggcacccaacactgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                   acgacceggccactcegtatcagtccggggtagacctggcccgccagct---gggcgcac
                                                                                                                                                                     cgacgccgcaccccgcgggccggccgggctggcaaggtcgtcgtcgtcgttggtgtccaccccc
                                                                                                                                                                                                                          ggcagttcaccggatccgcccccgcgatctgtgcgctgtggccggtgccggcaacgt
                                                                                                                                                                                                                                                                              cagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacg
                                                                                                                                                                                                                                                                                                                             gcaacgaccaggacgcgttcaacgcggtccggttgcgtctatgcgcccacaccgggccgatc
                                                                                                                                                                                                                                                                                                                                                                  gtgcgggcctgctgatcctctccgacagctactacgagcgcgaggccgacqgcggctaca
                                                                                                                                                                                                                                                                                                                                                                                ccggcgacttgctggttgcttgccgacgactatgacggccgggatgcagacgggcactaca
                                                                                                                                                                                                                                                                                                                                                                                                                                  gccctcagcgctggaagtacctgaccagtggtctgctgggggctgcagcggcggcggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cacgtggc----ctgagctacgccgacgcgacggcgaccgatcaacgcgctgtaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tcaaccgctaccacgccctggttgacccgctggtgcagaagccggggtaagacgtcggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         actgcgtgaagcagccggactgccccctcggcgacaaggacaccacccccgaccaggtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         actgcgccgctcgccggcctgccctct-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cccggggcgtggcccgcagtgaacccg---tcgagtgcctggacggggcgcgagatggacg
                                                   acctcctcacctacgagggagacggccacaccgcgtacggccgcgggcagctcctgcatcg
                                                                                                      gcgacccggccaccccctaccgctgggccgaggccctctccgaccagctcacctccggcc
                                                                                                                                                        gggagccgcaccgcatcgaggcggccggccaccccgatcgtcgtggtcggcaccaccc
                                                                                                                                                                                                         agggcctcgcctggtcctccctgaac----tgcgcgtactggccggtgaagcccacgg
                                                                                                                                                                                                                                                             ccccggacgaggtgcgccgacctccccgacttcgagaaggcgtccccggtcttcggcg
                                                                                                                                                                                                                                                                                                              gcaacctgatgttcgccaacgccgtgaactgcctcgacctccccgccgccttctcct
                                                                                                                                                                                                                                                                                                                                                                                                                   acgagggcgcctggcagcagctgcgcgagtccctcacctcggcgatcaaggagaaggacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ccgacggccgcaagctcaccgaatccctcgccaccaccggcgtgatcgccgcgatgtacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcaagaacctcaagtccttcttcgacgacctggacgcgaagcccctgcccgccggcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgcctgaacctggagcagacggagggcttcgagacggcgttccagtccttcgcgaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                agetgacetaegtgggagegtegtaeggeacetteetgggegegaeetaegeeggtetgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tctccacggtcgaggcggcacgcgacatggacgtcctgcgcgcggtgctgggcgacgaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               teggtacegcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cctacaaggagttcgccgagggctgcg--gggcggacgccgaagctgctgccc-acg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -gggcaccgactcggcccagtggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1184
                            1552
                                                    1658
                                                                                                       1598
                                                                                                                              1432
                                                                                                                                                          1538
                                                                                                                                                                                    1375
                                                                                                                                                                                                            1478
                                                                                                                                                                                                                                      1315
                                                                                                                                                                                                                                                               1424
                                                                                                                                                                                                                                                                                        1255
                                                                                                                                                                                                                                                                                                                 1364
                                                                                                                                                                                                                                                                                                                                           1195
                                                                                                                                                                                                                                                                                                                                                                                            1135
                                                                                                                                                                                                                                                                                                                                                                                                                      1244
                                                                                                                                                                                                                                                                                                                                                                                                                                             1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               944
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         707
```

```
망
                                                         δ
 밁
                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                            Query Match 10.:
Best Local Similarity 49.
Matches 663; Conservative
                                                                                                                                               The present sequence encodes an aminopeptidase designated SlpE. The specification also describes a tripeptidyl aminopeptidase (TAP) of Streptomyces, The aminopeptidase is endogenous to Streptomyces and cleaves an N-terminal sequence of X-Pro-Y, where X is an aliphatic or hydroxy amino acid and Y is an aliphatic, hydroxy or sulphur-containing amino acid. The TAP of Streptomyces are useful in the production of proteins, such as GM-CSF, interleukin-3 (IL-3), IL-6, EPO, tumour necrosis factor (TNF) SCF, IL-7 and IL-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1719
                                                                                                                                Sequence
                                                                                                                                                                                                                                         Example 25; Fig 29A-C; 83pp; English.
                                                                                                                                                                                                                                                            Streptomyces tri:peptidyl aminopeptidase - us N-terminal pro-peptide from secreted proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tripeptidyl aminopeptidase; TAP; N-terminal cleavage; GM-CSF; interleukin-3; IL-3; IL-6; EPO; tumour necros SCF; IL-7; IL-2; P8-2; SlpE; ds.
                                                                                                                                                                                                                                                                                          WPI; 1999-105117/09
P-PSDB; W87798.
                                                                                                                                                                                                                                                                                                                       Bartfeld D,
Krieger TJ,
                                                                                                                                                                                                                                                                                                                                                                        24-JUN-1994;
23-DEC-1993;
                                                                                                                                                                                                                                                                                                                                                                                                      24-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                         05-JAN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Clone P8-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  V84067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1553
                                                                                                                                                                                                                                                                                                                                                     (CANG-) CANGENE CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                            US5856166-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               19-MAR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      V84067 standard;
  475
                   271
                                       415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ω
          ttggcggtgatccgcgtccccgcga---cgggacagcgattcggagcactgctggtcaat 327
                                                 cgctgcgcgacggtgtccgtccccgtcgactacgaccaacccggtgggacacaagcgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cg = cg
ctcgcgctgatcccggtcccgggcgagcggggacgaccgcatcggctccctgctgttcaac
                                      1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1554
                                                                                                                                 1777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         encoding
                                                                                                                                                                                                                                                                                                                     Butler MJ,
Krygsman P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first
                                                                                                                                BP;
                                                                                                                                                                                                                                                                                                                                                                      94US-0265310
93US-0173508
                                                                                                                                                                                                                                                                                                                                                                                                      94US-0265310
                                                                                                                                                                                                                                                                                                                                                                                                                                                             /*cag= a
/product=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA; 1777
                                                                                                                                288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         an aminopeptidase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             entry)
                                                                                        10.1%;
49.7%;
                                                                                                                               Α;
                                                                                                                                607
                                                                                                                                                                                                                                                                                                                        Garven
Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                               protease
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ВP
                                                                             Score 158.2; I
Pred. No. 3.2e
0; Mismatches
                                                                             0;
                                                                                                                                Ç
                                                                                                                               666 G;
                                                                                                                                                                                                                                                                                                                       S,
                                                                                                                                                                                                                                                                                                                      Hadary D, Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         designated
                                                                                                                               216 T; 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tumour necrosis factor; TNF:
                                                                                        .2e-
                                                                                                 DB
                                                                             -23;
618;
                                                                                                                                                                                                                                                                       useful
                                                                                                 20;
                                                                                                                                                                                                                                                                                                                      Jenish
r G, Wa
                                                                                                                                other,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SlpE
                                                                              Indels
                                                                                                                                                                                                                                                                       for
                                                                                                 Length
                                                                                                                                                                                                                                                                                                                       Walczyk
                                                                                                                                                                                                                                                                                                                                 DL;
                                                                                                                                                                                                                                                                       removing
                                                                              54;
                                                                                                                                                                                                                                                                                                                       Ħ
                                                                             Gaps
                                       474
 534
                                                          270
                                                                              8;
```

```
δÃ
                                                                                      밁
                                                                                                              δÃ
                                                                                                                                                                      Ωy
                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
Š
                             В
                                                                                                                                            밁
                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
  1408
                                                                                                                                                                         1228
                             1513
                                                                                      1453
                                                                                                                                                                                                    1339
                                                                                                                                                                                                                                1168
                                                                                                                                                                                                                                                             1279
                                                                                                                                                                                                                                                                                        1108
                                                                                                                                                                                                                                                                                                                  1222
                                                                                                                                                                                                                                                                                                                                                                             1162
                                                                                                                                             1399
                                                                                                                                                                                                                                                                                                                                                1048
                                                                                                                                                                                                                                                                                                                                                                                                                                    1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1003
                                                                                                                                                                                                                                                                                                                                                                                                                                                              928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       589
                                                                                                                                                                                                                                                           aacgagcgtgatccctcgggggcgctacggcacgacgacccactcgcaaagggtcatatcg
                                                                                                                                                                                                                                                                            acgacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggt
gacctggcccgccagctggg----
                          gccccggtcctggtggtcggcaacacgggcgacccggccacgccctacgagggcgcccgc
                                            ggcaaggtcgtcgtggtgtccacccacccacgacccggccactccgtatcagtccggggta
                                                                                   tgccacgactggccggtggccggtcagcacgagaccgcggaggtgagcgcgcccgacgcg
                                                                                                  tgcgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgggccggggggct 1347
                                                                                                                                            gagaaggtctctcccgtcttcggcgcc----ttcctcggctgggacacggccgggtgg
                                                                                                                                                          tgcctggacgacaagcagaggccgaccgtggaggagacgaagaagctgctgccgaggttc
                                                                                                                                                                                                                              tgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatc
                                                                                                                                                                                                                                                                                                                  ctgaaggcggccgaggagg---gcgacggctcggagttgctggccctcgccgacggctac
                                                                                                                                                                                                                                                                                                                                ctgctggggctgcagcgcgacgacgaccttgctggtgcttgccgacgactat
                                                                                                                                                                                                                                                                                                                                                                          ccgctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gaacaggggtcgcggaagatcgccggcctg-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caggccaggggtttccagcgcgctggacgactacctggagtcgaccggccaggaaccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caaatggcgggatttcagaccgctttcaatgactacgccgccgactgcgccgctcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgcgtgatcctcgacgcggtggtggacccgggcgccgacacgatgggccacgccgagaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               atetectaeggeacegaacteggeggegtetaegeeeatetgtteeeegageaegtggge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tacagctacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcccgcgacatggacctgatgcggcacgtcctgggcgacgaggggatgcactacttcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aggggctgcgagaa---ggccgccggcaagctcatggaacacgtctcgaccacggacacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         atggccgactacagtccggccggcgtcaccccacgtcgaacaggtctaccggcagttggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tcgaccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgtaccggcgcgatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gtctcctccctgcacgagcggtacgacctggtgagctgggacccgcgcgggggtggccg--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cctgggggacccggggcgtcggcggtcgacatggtcgccgctatggcacccgcgatcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tccacgccggactccccggccgaggagcaggcctacctgaaggacgccgccgacttcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ttcggcggcccgggcgcctccggcgtctccacgatgcc----gtcctacgccgacacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -ccagcgagggcgtccgctgccgcaccgacgaggcgatcgaggccgccgagtcggtggac

    cgcaccgctgatcaccttcgacggcacccaa

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----ctggagcgg
                                                                                                                                                                         1287
                                                                                                                                                                                                                                1227
                                                                                                                                                                                                      1398
                                                                                                                                                                                                                                                             1338
                                                                                                                                                                                                                                                                                                                    1278
                                                                                                                                                                                                                                                                                                                                                                           1221
                                                                                                                                                                                                                                                                                                                                                                                                                                    1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1101
  1458
                                                           1407
                                                                                      1512
                                                                                                                                             1452
                                                                                                                                                                                                                                                                                         1167
                                                                                                                                                                                                                                                                                                                                                                                                       1047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1062
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             867
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    807
                                                                                                                                                                                                                                                                                                                                                                                                                                                              987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       882
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       646
```

```
밁
                δõ
                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                               Matches
                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                     Protease Tap-negative cells were transformed with a S. lividans 66 genomic library and screened with APA-beta-naphthylamide to isolate colonies contg. genes (099365-68) for novel proteases P5-4, P5-6, P5-10 and P8-2 (R80505-08). Impaired expression of such proteases by Streptomyces hosts improves the quality, quantity and stability of exogenous gene products.
                                                                                                                                                                                                                                                                                                                       Endogenous Streptomyces protease(s), opt. having impaired activ useful in prodn. of exogenous proteins with reduced proteolytic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Key
CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Protease; metalloendoproteinase;
protease-deficiency; protein secu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S. lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1573
                                                                                                                                                                                                                                                                                Claim 7; Fig.19; 142pp; English.
                                                                                                                                                                                                                                                                                                             degradation
                                                                                                                                                                                                                                                                                                                                                                  P-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                     Bartfeld
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23-DEC-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         W09517512-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                04-DEC-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q99368;
                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                          Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                (CANG-) CANGENE CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22-DEC-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q99368 standard; DNA; 1777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1519
                  271
                                            415
                                                                                                                                                                                                                                                                                                                                                                                1995-240673/31
  ttggcggtgatccgcgtccccgcga---cgggaccagcgattcggagcactgctggtcaat
                                                       cgctgcgcgacggtgtccgtcccgtcgactacgaccaacccggtgggacacaagcgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gacgggaccttgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aaggggacggtgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cacactgcggtgttcgatggcaaccagtgtgtgggactctgcggtgatgcactattttctc
                                        cacggtgcctacgggaacggaagcgactgtgtcgactccgcggtggacgcctacctgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          aggatggcggacgagctgggcaaggacgtcggcgtggtgctgacctggcagggcgaggga
                                                                                                                                                                                                                                                                                                                                                                                                       LT, Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                     D,
                                                                                                                                                               1777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protease P8-2
                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                       Butler MJ,
ostmeyer G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                               B₽;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          93US-0173508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94WO-US14772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
88..1502
/*tag= a
                                                                                                                                                             288 A; 607 C;
                                                                                                         9.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1533
                                                                                                                                                                                                                                                                                                                                                                                                         Walcyzk E;
                                                                                                                                                                                                                                                                                                                                                                                                                     Hadary D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ΒP
                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ase; tripeptidyl aminopeptidase;
secretion; ds.
                                                                                                         Score 155; DB 16;
Pred. No. 1.4e-22;
                                                                                                                                                               666
                                                                                              Mismatches
                                                                                                                                                             G; 216
                                                                                                                                                                                                                                                                                                                                                                                                                     Jenish
                                                                                                                                                             .
                                                                                                                                                                                                                                                                                                                                                                                                                     DĽ,
                                                                                              620;
                                                                                                                                                             0
                                                                                                                                                             other
                                                                                                                                                                                                                                                                                                                                                                                                                    Krieger
                                                                                                                     Length
                                                                                              Indels
                                                                                                                       1777;
                                                                                                                                                                                                                                                                                                                                                                                                                     TJ;
                                                                                                                                                                                                                                                                                                                                     activity
                                                                                              54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1518
                  327
                                          474
                                                                   270
                                                                                              8
                                                                                                                                                                                                                                                                                           Qy
                          Q
                                                      밁
                                                                          Qy
                                                                                                       밁
                                                                                                                               Qy
                                                                                                                                                            Ър
                                                                                                                                                                                  δÃ
                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                     δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ДЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
    1513
                                                                                                                                                             1339
                                                                                                                                                                                                                                                                                              1048
                                                                                                                                                                                        1168
                                                                                                                                                                                                                                                                                                                                                                             1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1003
                                                                                                                                                                                                                                                                                                                                                                                                                                  1063
                                                                                                                                                                                                                                                                                                                                                                                                       928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         475
gccccggtcctggtcggcaacacgggcgacccggccacgccctacgagggcgcccgc
                                                                                                                                                                                                                                                                                ctgctggggctgcagcgcggcgacgccggcgacttgctggtgcttgccgacgactat
                gacggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccgg
                                                                                                                                                                                                                                                                                                                                     acgacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggt
                                                                                                                                                                                                                                                                                                                                                                                           ccgctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                              gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atctcctacggcaccgaactcggcggcgtctacgcccatctgttccccgagcacgtgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      atggccgactacagtccggccggcgtcacccacgtcgaacaggtctaccggcagttggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtctcctccctgcacgagcggtacgacctggtgagctgggacccgcgcgggggtggccg--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ctcgcgctgatccgggtcccgggggggggggggggcgaccgcatcggctccctgctgttcaac
                                                                   tgcgcgctgtggccggtgccggcaacgtcgacgcgcgcaccccgcggcgcggccgggggct
                                                                                                         gagaaggtctctcccgtcttcggcgcc---
                                                                                                                     tgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatc
                                                                                                                                                                                                              aacgagcgtgatccctcggggcgctacggcacgacccactcgcaaagggtcatatcg
                                                                                                                                                                                                                                                                  ctgaaggcggccgaggagg---gcgacggctcggagttgctggccctcgccgacggctac
                                                                                                                                                                                                                                                                                                                      gaacaggggtcgcggaagatcgccggcctg------ctggagcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    caggccaggggtttccagcgcgctggacgactacctggagtcgaccggccaggaaccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   caaatggcgggatttcagaccgctttcaatgactacgccgccgactgcgccgctcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tacagctacygcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcccgcgacatggacctgatgcggcacgtcctgggcgacgaggaggatgcactacttcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tccacgccggactccccggccgaggagcaggcctacctgaaggacgccgccgacttcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgtaccggcgcgatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ttcggcggcccgggcgcctccggcgtctccacgatgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cctgggggacccggggcgtcggcgacctggtcgccgctatggcacccgcgatcgcc
                                                    tgccacgactggccggtggccggtcagcacgagaccgcggaggtgagcgcccgacgcg
                                                                                                                                                           tcgctggacgacaagcagaggccgaccgtggaggagacgaagaagctgctgccgaggttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgcgtgatcctcgacgcggtggtggacccgggcgccgacacgatgggccacgccgagaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -ccagcgagggcgtccgctgccgcaccgacgaggcgatcgaggccgccgagtcggtggac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -ggccgccggcaagctcatggaacacgtctcgaccacggacacg
                                                                                                       ttcctcggctgggacacggccgggtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -gtcctacgccgacacc
```

1572

1512 1407 1227

1278 1167 1338

1398 1287

1452

1107

1047

1161

987

1221

1101

1062

927

1002

747 942 807

867

627

567

765

822

687 882 507

705

588

7;

```
RESULT
Q99364
ID Q9
XX
AC Q9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
               A genomic library of S. lividans 66 was prepd. in pSS12, and recombinants were used to transform S. lividans 66 protoplasts. Colonies selected for color formation on GPL-beta-naphthylamide contained a gene encoding a novel tripeptidyl aminopeptidase, Tap. Impaired expression of Tap by Streptomyces hosts improves the quality, quantity and stability of exogenous gene products.
                                                                                                                                                                   Bartfeld [
Malek LT,
                                                                                                           Endogenous Streptomyces protease(s), opt. having impaired activity useful in prodn. of exogenous proteins with reduced proteolytic
                                                                                                                                                                                                                                                                                                                                                                                                                                            S. lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1408
Sequence
                                                                                 Claim 7; Fig.5; 142pp; English.
                                                                                                    degradation
                                                                                                                                                                                                                                                                                                                                               sig_peptide
                                                                                                                                                                                                                                                                                                                                                                   Key
                                                                                                                                                                                                                                                                                                                                                                                                               protease-deficiency; protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1573
                                                                                                                                                                                               (CANG-) CANGENE CORP
                                                                                                                                                                                                                  23-DEC-1993;
                                                                                                                                                                                                                                   22-DEC-1994;
                                                                                                                                                                                                                                                      29-JUN-1995
                                                                                                                                                                                                                                                                       W09517512-A
                                                                                                                                                                                                                                                                                                           mat_peptide
                                                                                                                                                                                                                                                                                                                                                                                              Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                          Protease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             04-DEC-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q99364;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q99364 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     u
                                                                                                                                         1995-240673/31
DB; R80504.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aaggggacggtgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gacgggaccttgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacctggcccgccagctggg....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cacggtgcctacgggaacggaagcgactgtgtcgactccgcggtggacgcctacctgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aggatggcggacgagctgggcaaggacgtcggcgtggtgctgacctggcagggcgaggga
                                                                                                                                                                  D, Butler N
, Soostmeyer
1908
                                                                                                                                                                                                                                                                                                                                                                                                                          metalloendoproteinase;
                                                                                                                                                                   Butler MJ,
ostmeyer G,
                                                                                                                                                                                                                                                                                                                                                                                                                                           protease
                                                                                                                                                                                                                                                                                                                                                                                              lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
BP;
                                                                                                                                                                                                                93US-0173508
                                                                                                                                                                                                                                   94WO-US14772
                                                                                                                                                                                                                                                                                                  263..1756
/*tag= c
                                                                                                                                                                                                                                                                                                                                               /*tag= 8
                                                                                                                                                                                                                                                                                         /product=
                                                                                                                                                                                                                                                                                                                   note- "the signal autolytic
                                                                                                                                                                                                                                                                                                                                        /*tag=
                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
146..1759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA;
322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1533
                                                                                                                                                                                                                                                                                                                                                                                                                                           tap gene
Α;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1908
                                                                                                                                                                                                                                                                                                                                                          α
753
                                                                                                                                                                   Hadary D,
Walcyzk E;
                                                                                                                                                                                                                                                                                          Tap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ΒP
c;
                                                                                                                                                                                                                                                                                                                                                                                                                sse; tripeptidyl aminopeptidase;
secretion; ds.
809
                                                                                                                                                                                                                                                                                                                  tripeptide is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -cgcaccgctgatcaccttcgacggcacccaa
                                                                                                                                                                                                                                                                                                                             peptide
ç;
                                                                                                                                                                            Jenish
225
T,
                                                                                                                                                                             DΓ,
0
                                                                                                                                                                                                                                                                                                                              followed
                                                                                                                                                                            Krieger
                                                                                                                                                                                                                                                                                                                             þу
                                                                                                                                                                             ŢJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1458
```

Query Match

30

Score

113

2;

DB 16;

Length

```
Qy
                                                                                                       B
                                                                                                                                  Qy
                                                                                                                                                                 Вb
                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity
Matches 669; Conserv
                 1020
                                                                                                       1072
                                                                                                                                                                  1012
                                                                                                                                                                                                840
                                                                                                                                     900
                                                                                                                                                                                                                             967
                                                                                                                                                                                                                                                           780
                                                                                                                                                                                                                                                                                      907
                                                                                                                                                                                                                                                                                                                  720
                                                                                                                                                                                                                                                                                                                                                847
                                                                                                                                                                                                                                                                                                                                                                             660
                                                                                                                                                                                                                                                                                                                                                                                                           790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       303
                                                                                                                                                                                                                                                                                                                                                                                                                                     600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12
tcagcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcagcgacgccgg
                                                                                                                       ggtcaaccgctaccacgccctggttgaccccgctggtgcagaagccgggtaagacgtcgga
                                                                                                                                                               cttcgagggccgctggaaggactggcaggactgggtcgccgcgaacgacgccgcctacca
                                           gaagaagccgctgggcggcgtcgtcggaccggccgagctgatctccttcttccagagcgc
                                                                                                                                                                                  ctacgccgactgcccgctcgccggcctgcctctgggcaccgactcggcccagtg
                                                                                                                                                                                                                                                                                                                                              aggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgctta
                                                                                                                                                                                                                                                                                                                                                                                                                       cttggccaatatcggtaccgctcgctcgcacgggacatggacatggttcgccaagcgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgtcgaacaggtctaccggcagttggcccaggactgtgttgaccgggatgggcttcagctt
                                                            tccacgtggcctgagctacgccgacggcgacgacgacgcaccatcaacgcgctgtacagccc
                                                                                                                                                                                                                          ccgcgacaagatctggtaccaggccaac------ctggaccaggacgtcgc
                                                                                                                                                                                                                                                                                                    cctggaacggttcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gggcttcgacccgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgccgctatggcacccgcgatcgccgac---accgacattctccgccacttcgacctggt 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cggtgggacacaagcgaagttggcggtgatccgcgtccccgcgacggga-----ca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tgcgccggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacac 191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cctagcagcgccccgttggccggcgactgaagaacccggcgccggccaaaccccggg 131
                                                                                                    cctcggcgacacccgcgccgaggtccaggaccagtggctgaagctgcgcgccgccgccgc
                                                                                                                                                                                                                                                      cgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatga
                                                                                                                                                                                                                                                                                     cggcaccctcttcccggaccacgtccgccgcatggtcgtcgacagcgtcgtcaacccgtc
                                                                                                                                                                                                                                                                                                                                                                                                        cccgcacatgacc---acgccgaacaccgcgcgcgacctcgacgtcatccgcgccgccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcgc---aagctcgcccgcgagtacgccgagggctgcttcgagcgcagcggcgagatgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gttcgtcaaggcacccaaggccgaccccgtgcccggctccgaggccgacaagcgcccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cggcttcgacccgcgcgcgtcggccactccgcgcccatctcctgcgtcgacccgcagga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ggcccgcgtcacgaacaagagcgcggtctgggccaacacggccaaggcctacgacttcgt 612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcgccagggcgccctgatctacaaccccggcggtcccggcggctccggcctgcgtttccc 552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcgattcggagcactgctggtcaatcctgggggacccgggggcgtcggcggtcgacatggt 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtacggcaagcagatcaggctcgccgtcgaccgcatcggcaacaccggaaccaggagcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gaacctgcccaagcccatccagtgcggctacgtcacggtgccgatggactacgccaagcc 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcactggtcaccgccacgctgatcgccggcgccgtctcggcacccgccgcgagcgccgcc 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgccgccgcgccgcc----cgggcgggcatcgactgggaggactgcgactgccgactg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ccggccgacggccacgggcggggggctgggaccgggaggcgcgcggggtgccgccatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 46.18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. 2.60
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2.6e-14;
ches 743;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                 1079
                                           1191
                                                                           1019
                                                                                                       1131
                                                                                                                                                                  1071
                                                                                                                                                                                                                             1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    492
                                                                                                                                                                                                899
                                                                                                                                                                                                                                                                                     966
                                                                                                                                                                                                                                                                                                                                                906
                                                                                                                                                                                                                                                                                                                                                                            719
                                                                                                                                                                                                                                                                                                                                                                                                                                     659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    479
                                                                                                                                                                                                                                                                                                                                                                                                         846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 789
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       71
```

```
δÔ
RESULT
V84065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                              CDS
                             Bartfeld D,
Krieger TJ,
                                                                                    24-JUN-1994;
23-DEC-1993;
                                                                                                                                          05-JAN-1999
                                                                                                                                                                                            mat_peptide
                                                                                                                                                                                                                  sig_peptide
                                                                                                                                                                                                                                                                                            Streptomyces
                                                                                                                                                                                                                                                                                                                             Tripeptidyl aminopeptidase;
GM-CSF; interleukin-3; IL-3;
                                                                                                                                                                                                                                                                                                                                                              Tripeptidyl
                                                                                                                                                                                                                                                                                                                                                                                                                               V84065 standard; DNA; 1908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1192
                                                                                                                    24-JUN-1994;
                                                                                                                                                             US5856166-A
                                                                                                                                                                                                                                                                                                                                                                                     19-MAR-1999
                                                                                                                                                                                                                                                                                                                                                                                                          V84065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1612 cctgatcaccga 1623
                                                              (CANG-) CANGENE
1999-105117/09
DB; W87796.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cccgctgaacgtgaagaccggcaagggacttccgccggtgctgatcgtccagtccgagcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gatcaccttcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gacgccgcacccgcggcgccggccggggctggcaaggtcgtcgtggtgtccaccaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcagttcaccggatccgccccccgcgatctgtgcgcgttgtggccggtgccggcaacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgccaactggcgcacctgggaccgggaccaccccggctccaccgcgaccacccgttcat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            agcggcctgggtggccgaccaacggatccgtcaggtcgcccgttccttagctacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ctccgcggagaacggcaacgccgtctacacggccgtcgagtgcaccgacgccaagtggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         caacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgacacccaggcgctcgtcgacgccgcccccgacctgtccgacaccgcgggcaacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgacttgctggtgcttgccgacgactatga---cggccgggatgcagacgggcactacag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gacctgggccaacgcctggatgaacctgccctgtgccacctggccggtcaagcagcagac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cccgtactacgactccgcctgggcgccgaccgcggagatcttcagcaagtacgtcgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tgacgccgccaccccgtacgagggcgccgtcgaactgcaccagcggttccggggatcccg
                                                                                                                                                                                                                                                                                                                                                             aminopeptidase (tap)
                             Krygsman
                                                                                                                                                                                                                                                                                              lividans
                                                                                                                                                                                                                                                                                                                                                                                   (first
                                         Butler MJ,
                                                                                   94US-0265310
93US-0173508
                                                                                                                    94US-0265310
                                                               CORP
                                                                                                                                                                                 /*tag= b
263..1756
/*tag= c
                                                                                                                                                                                                                  /product=
146..262
                                                                                                                                                                                                                          /transl_except= (146..148, aa: Met)
/product= Tripeptidyl_aminopeptidase
                                                                                                                                                                                                                                                                                                                   ds
                                                                                                                                                                                                                                                             Location/Qualifiers
146..1759
                                                                                                                                                                                                                                                   *tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1448
                                                                                                                                                                                                                                                                                                                                                                                   entry 
                               P,
                                                                                                                                                                                                                                                                                                                              IL-3;
                               Garven
Malek
                                                                                                                                                                                                                                                                                                                                                                                                                               ВP
                                                                                                                                                                                                                                                                                                                            TAP; N-terminal cleavage; protein production;
; IL-6; EPO; tumour necrosis factor; TNF;
                              LT,
                                                                                                                                                                                                                                                                                                                                                             gene
                             Hadary D, C
Soostmeyer
                             Jenish
r G, Wa
                             sh DL;
Walczyk
                              Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1316
```

```
Qy
                                          밁
                                                                  Qy
                                                                                              DЬ
                                                                                                                         Qy
                                                                                                                                                       밁
                                                                                                                                                                               Qy
                                                                                                                                                                                                               B
                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                QY
                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                        Db
                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The present sequence encodes a tripeptidyl aminopeptidase (TAP) of Streptomyces. The aminopeptidase is endogence to Streptomyces and cleaves an N-terminal sequence of X-Pro-V, where X is an aliphatic or hydroxy amino acid and Y is an aliphatic, hydroxy or sulphur-containing amino acid. The TAP of Streptomyces are useful in the production of proteins, such as GM-CSF, interleukin-3 (IL-3), IL-6, EPO, tumour necrosis factor (TNF) SCF, IL-7 and IL-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Streptomyces tri:peptidyl aminopeptidase
                                                                                                                                                                                                                                                                                                                                                                                                                                                 433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       192
                                                                                                                                                                                                                                                                         613
                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                        493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  317
                                                                                                                                                                                                                                                                                                                                 553
                                                                                                                                                                                                                                                                                                                                                             363
                                                                                                                                                                                                                                                                                                                                                                                                                     303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             72 cctagcagcgccccgttggccggcggcgactgaagaacccgggcgccgccggccaaaccccggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
mes 669; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gcgccgcagaccgttgagctcggcgctgctgtccttcgggttgctgctcggcggactgct
cctggaacggttcggtactcatgtgcggggcgatggtcctcgacggcgctatcgatccagc
                                                       aggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgctta
                                                                                                cccgcacatgacc---acgccgaacaccgcgcgcgacctcgacgtcatccgcgccgccct
                                                                                                             cttggccaatatcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgtt
                                                                                                                                                      gcgc---aagctcgccgcgagtacgccgagggctgcttcgagcgcagcggcgagatgct
                                                                                                                                                                      cgtcgaacaggtctaccggcagttggcccaggactgtgttgaccggatgggcttcagctt
                                                                                                                                                                                                                              gggcttcgacccgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgc
                                                                                                                                                                                                                                                                                                                               ggcccgcgtcacgaacaagagcgcggtctgggccaacacggccaaggcctacgacttcgt
                                                                                                                                                                                                                                                                                                                                              cgccgctatggcacccgcgatcgccgac---accgacattctccgccacttcgacctggt
                                                                                                                                                                                                                                                                                                                                                                                       gcgccagggcgccctgatctacaaccccggcggtcccggcggctccggcctgcgtttccc
                                                                                                                                                                                                                                                                                                                                                                                                       gtacggcaagcagatcaggctcgccgtcgaccgcatcggcaacaccggaaccaggagcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                cggtgggacacaagcgaagttggcggtgatccgcgtccccgcgacggga----ca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gaacctgcccaagcccatccagtgcggctacgtcacggtgccgatggactacgccaagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccgccgcccgccc----cgggcgggcatcgactgggaggactgcgcagccgactg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tgcgccggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccggccgacggccacgggcacggggggcgcggggggggcgcgcgcgccatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gcactggtcaccgccacgctgatcgccggcgccgtctcggcacccgccgcgagcgccgcc
                                                                                                                                                                                                             gttcgtcaaggcacccaaggccgaccccgtgcccggctccgaggccgacaagcgcgccca
                                                                                                                                                                                                                                                                      cggcttcgacccgcgcgtcggccactccgcgcccatctcctgcgtcgacccgcagga
                                       1908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          pro-peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B₽;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12A-B; 83pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 322 A; 753 C; 608 G; 225 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            from secreted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 113.2; 1
Pred. No. 2.6e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2; DB 20;
2.6e-14;
nes 743;

    useful

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    131
                                                                                                846
                                                                                                                                                                                                                                                                                                                                                                                                                                                 492
                                          906
                                                                                                                            659
                                                                                                                                                         789
                                                                                                                                                                                    599
                                                                                                                                                                                                               732
                                                                                                                                                                                                                                          539
                                                                                                                                                                                                                                                                      672
                                                                                                                                                                                                                                                                                                   479
                                                                                                                                                                                                                                                                                                                               612
                                                                                                                                                                                                                                                                                                                                                            419
                                                                                                                                                                                                                                                                                                                                                                                        552
                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             71
```

7 ;

밁

907

cggcaccctcttcccggaccacgtccgccgcatggtcgtcgacagcgtcgtcaacccgtc

```
В
                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ДЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                   Herpes simplex virus ICP4; stimulation; inhibition; HS
                                                                                                                                                                                                                                                                                                                                                                                                       1377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1020
                                                                                                                            Herpes
                                                                                                                                                                                        The nucleotide sequence of the Herpes simplex virus
                                                                                                                                                                                                                  29-JAN-1999
                                                                                                                                                                                                                                                                 V68520 standard;
                                                                                                                                                                                                                                                                                                                                1612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1257
                 22-OCT-1998
                                          WO9846637-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             967
                                                                                                                                                                                                                                                                                                                                             gatcaccttcga 1448
                                                                                                                                                                                                                                                                                                                            cctgatcaccga 1623
                                                                                                                                                                                                                                                                                                                                                                                          cgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgct
                                                                                                                                                                                                                                                                                                                                                                                                                             cccgctgaacgtgaagaccggcaagggacttccgccggtgctgatcgtccagtccgagcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agcggcctgggtggccgaccaacggatccgtcaggtcgccccgttccttagctacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          caacgaccaggacgcgttcaacgcggtccggtctatgcgcccacaccggccgatcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgacttgctggtgcttgccgacgactatga---cggccgggatgcagacgggcactacag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cccgtactacgactccgcctgggcgccgaccgcggagatcttcagcaagtacgtcgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ggtcaaccgctaccacgcctggttgacccgctggtgcagaagccgggtaagacgtcgga
                                                                                                                                                                                                                                                                                                                                                                             tgacgccgccaccccgtacgagggcgccgtcgaactgcaccagcggttccggggatcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                  gacgccgcaccccgcggccggccggggctggcaaggtcgtcgtggtgtccaccacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacctgggccaacgcctggatgaacctgccctgtgccacctggccggtcaagcagcagac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctccgcggagaacggcaacgccgtctacacggccgtcgagtgcaccgacgccaagtggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gaagaagccgctgggcggcgtcgtcggaccggccgagctgatctccttcttccagagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cttcgagggccgctggaaggactggcaggactgggtcgccgcgaacgacgccgcctacca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ctacgccgccgactgcgccgcccgcctgccctctgggcaccgactcggcccagtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgccaactggcgcacctgggaccgggacaacacccggctccaccgcgaccacccgttcat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgacacccaggcgctcgtcgacgccgccccgacctgtccgacacccgcgggcaacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tccacgtggcctgagctacgccgacgcgacgagggcaccatcaacgcgctgtacagccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ccgcgacaagatctggtaccaggccaac---
                                                                                                                            simplex
                                                                                                                                                                                                               (first entry)
                                                                                                                             virus
                                                                                        Location/Qualifiers 361..4257
                                                                 /product=
                                                                                                                                                                                                                                                                 DNA;
                                                                           /*tag=
                                                                                                                                                                                                                                                                 4257
                                                                                                                                                    HSV ICP4; modulator; HSV infection; ss.
                                                                 "HSV
                                                                                                                                                                                                                                                                 ВP
                                                                 ICP4
                                                                 protein'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -ctggaccaggacgtcgc 1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1019
                                                                                                                                                                                                                                                                                                                                                                                                      1436
                                                                                                                                                                                                                                                                                                                                                                                                                              1551
                                                                                                                                                                                                                                                                                                                                                                                                                                                     1376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1491
```

```
Š
                                                                                                                                                                                밁
                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                $\times CCCCCCCCCXX\times T \times T \t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match 4.3
Best Local Similarity 44.9
Matches 247; Conservative
      1383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This is the nucleotide sequence of Herpes simplex virus ICP4 use the method of the invention as modulators of apoptosis. The meth and products can be used to identify compounds which modulate (stimulate or inhibit) apoptosis in cells. They can be used to immortalise cells for the study of these cells or for growing ce in large numbers for the productions of proteins. They can also used for stimulating apoptosis in cells, e.g. for treating a sub with a HSV infection.
                                                            2835
                                                                                                                                                                                                                                       1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1143
                                                                                                                                                                                                                                                                                                    2715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1023
                                                                                                                                                                                                                                                                                                                                                          1203
                                                                                                                                                                                                                                                                                                                                                                                                                    2655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Use of herpes simplex virus U(s)3 polypeptide - for developing products for modulating apoptosis in cells and for identifying compounds which act as stimulators or inhibitors of apoptosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1998-594559/50.
P-PSDB; W80810.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 4257 BP; 412 A; 1768 C; 1663 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Example
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Leopardi R,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (ARCH-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16-APR-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16-APR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   963
ggccactccg
                                                                                        caccggatccgcccccgcgatctgtgcgcgttgtggccggtgccggcaacgtcgacgcc
                                                                                                                                                                                                                                                                                                                            ctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacgggcagtt 1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccaggacgcgttcaacgcggtccggtctatgcgcccacaccggccgatccagcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cttgctggttgcttgccgacgactatgacggccgggatgcagacgggcactacagcaacga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcgacgccggcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acgtggcctgagctacgccgacgcgacgacgggcaccatcaacgcgctgtacagccctca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgccgccgcggacctgctgtttgacaaccagagcctgcgccccctgctggcggcggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           caaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgccggggccctgggcccgcgctgccgcgggacccgcgcctgccgagctccgcggccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgccgccgactgcgccgctcgccggcctgccctctgggcaccgactcggcccagtgggt
                                                         ggcgcccgcggccgccctggaggcctactgctccccgcgcgccgtggccgagctcac
                                                                                                                                                                          cgagggccccgacccctgggcggctggcggcagcccccgggggcccagccacacggc
                                                                                                                                                                                                                                                                                              gccccgggccgccgcgcaggcccgccgcccgtggccgtgtcgcgccggcccgc
                                                                                                                                                                                                                                                                                                                                                                                                                 cccgaagacgaagaagagcggcgcggacgccccgggctcggacgccccgcgccccctccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ARCH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2; Pages 60-63; 85pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEV CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Roizman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97US-0843659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98WO-US07573
      1392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.28;
44.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 65.2; DB 19;
Pred. No. 8.9e-05;
0; Mismatches 303;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                414 T; 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ICP4 used in The methods
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a subject
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cells
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                be
                                                               2894
                                                                                                                      1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          902
```

0

2895

ggaccacccg

```
RESULT VIO 362 VIO 471 AC VIO 472                                                                                                                                                  Q
                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                   망
                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                              δÃ
       밁
                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 247; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The herpes simplex virus (HSV) alpha-4 gene encodes infected cell protein number 4 (ICP4). Both the alpha-4 gene and ICP4 can be used to block cell apoptosis. Similarly the administration of an agent that inhibits ICP4 or the alpha-4 gene can induce apoptosis in HSV infected cells. This can be used for the immortalisation of cells, production of proteins, gene therapy, or inhibition of cell death induced in vivo. They can also be used for production of therapeutics comprising inhibitors of HSV ICP4 function, useful for treating HSV function.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Key
       2535
                                                                                                                                                                                                                                                                                                     2355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Use of herpes simplex blocking apoptosis in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Disclosure; Fig 2; 63pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 1998-130697/12.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           05-FEB-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Infected cell protein therapeutics; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 4257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Leopardi R,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          26-JUL-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23-JUL-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W09804709-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Herpes simplex virus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        V10362;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      V10362 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (ARCH-) ARCH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Infected cell protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30-JUN-1998
                                                                                                                                                                                                                                                  903
                                                                                                                                                                                                                                                                                                                         843 cgccgccgactgcgccgctcgccgtcgccctctgggcaccgactcggcccagtgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    œ
                              gcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcggcggcggcggcgg
                                                                                                                            acgtggcctgagctacgccgacgcgacgacgaccatcaacgcgctgtacagccctca
                                                                                                                                                                                                                             caaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatcc
                                                                                                                                                                                                                                                                                             cgccggggccctgggccccgcgctgccgcgggacccgcgcctgccgagctccgcggccgc
cgccgccgcggacctgctgtttgacaaccagagcctgcgccccctgctggcggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W40200.
                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Roizman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DEV CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          96US-0690473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           97WO-US12904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361..4257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product= "Infected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      412
                                                                                                                                                                                                                                                                                                                                                                                                                     4.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        virus ICP4 polypeptide - useful for, e cells, production of proteins and gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1768 C;
                                                                                                                                                                                                                                                                                                                                                                                            Score 65.2; DB 19;
Pred. No. 8.9e-05;
0; Mismatches 303;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4 alpha-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ICP4; alpha-4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1663 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   414 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cell apoptosis;
                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 4257;
                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        i.g.
therapy
                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                   1082
                                                                                                                                                 1022
                                                                                                                                                                                                 2474
                                                                                                                                                                                                                                                                                                  2414
                                                                                                   2534
                                                                                                                                                                                                                                                  962
                                                                                                                                                                                                                                                                                                                                                                                                 0
```

```
RRSULT
Q76213/
XX Q7622
XX Q762
XX Q762
XX HSV;
XX HSV;
XX HSV;
XX HETP
XX HETP
TATA
FT misc
F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2835
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           misc_RNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HSV L/ST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               04-AUG-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q76213 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2895
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2715
                                          Disclosure;
                                                                                                     Herpes Simplex Virus
                                                                                                                                                                      WPI; 1995-022825/03.
                                                                                                                                                                                                                                                                                                                                         20-MAY-1994;
                                                                                                                                                                                                                                                                                                                                                                                   08-DEC-1994.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             misc_RNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Herpes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HSV; junction-spanning transcript; L/ST; therapy; virucide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q76213;
                                                                                                                                                                                                                                                                                                    20-MAY-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                              WO9428156-A
                                                                                                                                                                                                                                                       (DAND ) DANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TATA_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ggaccacccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggccactccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgagggccccgacccctgggcggctggcggcagcccccgggggcccagccacacggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caceggatcegeeeceegegatetgtgegegetgtggeeggtgeeggeaegtegaegee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccaggacgcgttcaacgcggtccggtctatgcgcccacaccggccgatccagcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccccgggccgccgcggcaggcccgccgcgcccgtggccgtgtcgcgccgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgcgcccgcgcccccccccgcgccccggggcccgagcccgcccccgcccagcccgcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 simplex virus type 1.
                                                                                                                                                                                                                PΑ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     region
                                     Page 38-44; 64pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first
                                                                                                                                                                                                                                                          FARBER CANCER
                                                                                                                                                                                                                Yeh
                                                                                                                                                                                                                                                                                                  93US-0065146
                                                                                                                                                                                                                                                                                                                                       94WO-US05770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /*tag= b
/note= "ICP4
229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*tag= c
/note= "5'
370..372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         220..225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   199..204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "first codon of ORF-1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ′*tag=
                                                                                                                                                                                                             ŗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               entry)
                                                                                                        (HSV) specific junction spanning L/ST synthesis, in the treatment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 end
                                                                                                                                                                                                                                                          TNST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             binding site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                                                          INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the L/STs"
                                                                                                        transcript
of HSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2834
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2714
```

An HSV-specific junction-spanning transcript (L/ST) maps

at the

ú

```
RESULT
X53491/
                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 323332×3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 246;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                       Human adenosine Al receptor antisense oligonucleotide
                                                                                                                                                                                                                                                                                                                                   3779
                chronic obstructive pulmonar colon cancer; breast cancer;
                                             respiratory distress syndrome; pain; cystic fibrosis pulmonary hypertension; pulmonary vasoconstriction;
                                                                                           impaired respiration; inflammation; lung disease;
pulmonary vasoconstriction; inflammation; allergic rhinitis;
                                                                                                                                                                                        05-JUL-1999
                                                                                                                                                                                                                                                      X53491 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        end to the b repeat sequences of HSV DNA at approx. 3 and 125 kb, and extends into the c repeat sequences of HSV DNA. Compounds that inhibit HSV L/ST synthesis may be used as anti-HSV virucides. The HSV-1 DNA sequence in the region of the L/STs
                                                                            acute asthma; allergy; asthma; impeded respiration
                                                                                                                          Antisense oligonucleotide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 12001 BP; 1568 A;
hepatocellular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              is given
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          843 cgccgccgactgcccgctcgccggcctgccctctgggcaccgactcggcccagtgggt 902
                                                                                                                                                                                                                                                                                     10
                                                                                                                                                                                                                                                                                                                                                               ggccactccg
                                                                                                                                                                                                                                                                                                                                                                                                                         gcaccccgcggccggggccgggccaggccatgtcgtcgtggtgtccaccaccaccaccacc
                                                                                                                                                                                                                                                                                                                                   GGACCACCCG
                                                                                                                                                                                                                                                                                                                                                                                            caccggatccgccccccgcgatctgtgcgccgttgtggccggtgccggccaacgtcgacgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCCCGGGCCGCGCGCAGGCCCGCCCCCCGTGGCCGTGTCGCCCCGGCCCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ctgggtggccgccgaccaacggatccgtccaggtcgccccgttccttagctacgggcagtt 1262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatccagcggc 1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactacagcaacga 1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gcgctggaagtacctgaccagtggtctgctggggctgcagcggcggcggcggcgga 1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGCCGCCGCGGACCTGCTTTTGACAACCAGAGCCTGCGCCCCCTGCTGGCGGCGGCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     caaccgctaccacgccctggttgacccgctggtgcagaagccggggtaagacgtcggatcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGCCGGGGCCCTGGGCGCGCGCGCGGGGACCCGCGGCCTGCCGAGCTCCGCGGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGAGGGCCCCGACCCCTGGGGGGCTGGCGGCGGCAGCCCCGGGGCCCACACACGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 acytygcctgagctacgccgacgcgacgacgaccatcaacgcgctgtacagccctca
              obstructive pulmonary disease; leukemia; lymphoma; carcinoma; ancer; breast cancer; lung cancer; pancreatic cancer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              in Q76213.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                                                                                   3770
                                                                                                                                                                                                                                                                                                                                                               1392
                                                                                                                                                                                                                                                      DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4.18;
                                                                                                                                                                                                                                                      114955
kidney
                                                                                                                          multiple target; antisense treatment;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                      ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 63.6; DB 16; Pred. No. 0.00019;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
 cancer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4315 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1561 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    304;
                                                          fibrosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 12001;
hepatic metastasis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0
                                                                                                                                                      fragment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                          3840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
```

20 В Qy В δ V 밁 Ş

313

gcactgctggtcaatcctgggggacccggggcgtcggcggtcgacatggtcgccgctatg

372

312

105191

GCCCGGCCGGCGCGCCCVNNHNNNSCGGCCCGGCCGGCGCGCCCCVGNNHNNNSC ggtgggacacaagcgaagttggcggtgatccgcgtccccgcgaccgggacagcgattcgga

105190

253

δõ 망 δõ

74

tagcagcgccccgttggccggcgactgaagaacccggcgccggccaaaccccgggtg gccgcagaccgttgagctcggcgctgctgtccttcgggttgctgctcggcggactgctcc

105430

14

Matches

466;

Conservative

137;

Mismatches

935;

Indels

10;

Gaps

5

73

Query Match
Best Local Similarity

Db 105370

134

194

SCGGCCCGGCCGGCGCCCNNHNNNSCGGCCCGGCCGGCGGCGCCCCNNHNNNSCG

cgccggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacacca

193

105311

133

```
The specification describes antisense oligonucleotides (X52869-X55271) CC directed against at least 2 mRNAs selected from target genes, coding and conno-coding regions of RNAs corresponding to target genes, gene cc initiation codons, genomic flanking regions, intron-exon borders, the CC frend, the 3'-end and the juxta-section between coding and non-coding cc regions and all segments of RNAs encoding proteins associated with one CC more diseases, conditions or mixtures. The antisense oligonucleotides come cc may be derived from sequences X55272-74. These multiple target coligonucleotides (specifically X55180-271) can be used for the antisense ct reatment of diseases and conditions. Typical diseases and conditions care those associated with impaired respiration and inflammation, cc including lung diseases, pulmonary vasconstriction, inflammation, cc altergic rhinitis, acute asthma, allergies, asthma, impeded respiration, crespiratory distress syndrome, pain, cystic fibrosis, pulmonary crespiratory distress syndrome, pain, cystic fibrosis, pulmonary pulmonary vasconstriction, emphysema, chronic obstructive pulmonary disease (COPD), and cancers such as leukemias, lymphomas, cc carcinomas e.g. colon cancer, breast cancer, melanoma, hapatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, hapatic contents as all types of cancers which may metastasize or have
                                                                                                                                    Sequence 114955 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Disclosure; Page 37; 120pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      09-JUN-1998;
17-SEP-1997;
                                                                                                                                                                                                           metastasized to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          vasoconstriction
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New antisense oligonucleotides used in treatment of, e.g. pulmonary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 1999-229400/19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (UYEC-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          17-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25-MAR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO9913886-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  prostate cancer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EAST CAROLINA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98US-0093972
97US-0059160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98WO-US19419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SS
                                                                                                                                    6071 A;
                                                                                                                                                                                                    lungs,
3.9%;
30.1%;
                                                                                                                                                                                                       including
Score 61.6; DB 20; Pred. No. 0.00053;
                                                                                                                                    29417 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   English
                                                                                                                                       36712 G;
                                                                                                                                                                                                       breast and prostate cancer.
                                                                                                                                       21328
                            Length 114955
                                                                                                                                       Τ.
                                                                                                                                       21427
                                                                                                                                       other;
```

Š

```
В
                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                        рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вр
                                                                    104116 NNHNNNSGCCCGGCCCGACGCCGNNHNNNSGCCCGGCCCGACGCCCGNNHNNNSGCCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             104416 HNNNSCCGGCGGGGGGGGGGGCGCCCVGGCGGNHNNNSCCCGGCCGGCGGGGGGGCGCCCV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             104596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  104653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     104713 NNHNNNSGCGCGCCCVGGCCVGCGGNNHNNNSGGCGCGCCCVGGCCCVGCGGNNHNNNSCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   104773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          104833
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    104890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105070 NNNSCGGCCCGGCCGGCGCGCGCCCCVGGCCNNHNNNSCGGCCCGGCCGGCGCGCGCGCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    105130
                                                                                                                                                                                                                                                                                                                                                                                            1151
                            1390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            791
CGGNNHNNNSGCCCGGCCCGNNHNNNSGCCCGGCCCGANNHNNNSGCCCGGCCCGACNNH
                                                                                                                                                                                                                                                                                             ccg-ccgaccaacggatccgtcaggtcgcccgttccttagctacgggcagttcaccgga
                                                                                                                                                                                                                                                                                                                                            agtacctgaccagtggtctgctggggctgcagcggcgacgcgggcgacttgctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCGGCGCCCCCCCCCCCCCCGCGCNNHNNNSCGGCCGGCGCGCGCCCCCCGGCCCCCCGGNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tgagctacgccgacgacgacggcaccatcaacgcgctgtacagccctcagcgctgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCGCGCCCVGGCCVGCGGNNHNNNSGCCGGCGGCGCGCCCVGGCCVGCCGGNNHNNNSGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         accacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatccacgtggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                actgegeeegetegeetgeeetetgggeaeegaeteggeeeagtgggteaaeeget
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCGCGCCCVGGCCVGCGGNNHNNNSGCG----GCGCGCCCVGGCCVGCCGNNHNNNSGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ggtactcatgtg--cgggcgatggtcctcgacggcgctatcgatccagccgttagcccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCCVGGCCVGCGGNNHNNNSGCGCCCVGGCCVGCGGNNHNNNSCGCGCCCVGGCCVGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      atcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VGGCCVGCGGNNHNNNSCCCVGGCCVGCCGGNNHNNNSGCCCVGCCCVGCCGNNHNNNSCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NNNSGGCCVGCGGNNH----NNNSVGGCCVGCGGNNHNNNSCVGGCCVGCGGNNHNNNSCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGCCCGGCCGCCGCCCCVGGNNHNNNSCGGCCCGGCCGGCCGCCCCCVGGCNNH 105071
                                                                                                            <u>gCggCgCCggCCggggCtggCaaggtCgtCgtggtgtCCaCCaCCaCCcaCgaCCcggCCaCt</u>
                                                                                                                                                           NNNSGCCCGGCCCGACGNNHNNNSGCCCGGCCCGACGCNNHNNNSGCCCGGCCCGACGCC
                                                                                                                                                                                                   tecgeeeeegeatetgtgegetgtggeggtgeeggeaaegtegaegeegeaeeee
                                                                                                                                                                                                                                                                                                                                                                                       cgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatccagcggcctgggtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                      GGCCVGCGGNNHNNNSGCCCGGCCGGCGCGCGCCCCVGCCCVGCGNNHNNNSGGCCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgcttgccgacgactatgacggccgggatgcagacggcactacagcaacgaccaggacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCGCGCCCVGGCCVGCCGNNHNNNSCCGGCGCCCCCCCCCCCCCCGGCNHNNNSCCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          taccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaatatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCGGCGCGCCCVGGCCVGCNNHNNNSCGGCCCGGCCGGCGCGCGCGCCCVGGCCVGCGNNH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 taccggcgcgatccgatggccgactacagtccggccggcgtcaccccacgtcgaacaggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VGGCCVNNHNNNSCGGCCCGGCCGGCGCGCGCCCVGGCCVGNNHNNNSCGGCCCGGCCG
                       1449
                                                                                                                                                                                                                                                                                                1269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1030
                                                                    104057
                                                                                                                                                                                                                                                   104177
                                                                                                                                                                                                                                                                                                                                                                                            1210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       104417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        104537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                104597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       104654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              104714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          105011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  432
                                                                                                                                                           104117
                                                                                                                                                                                                                                                                                                                                            104237
                                                                                                                                                                                                                                                                                                                                                                                                                                      104297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        104774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               104834
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                104951
```

οy

Ş

δ

Qy

Š

have

δÃ

Qγ

õ

```
Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ДЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 103936 GANNHNNNSGCCCGGCCCGACGCCGAVGACNNHNNNSGCCCGGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         104056 CCCGACGCCCCNNHNNNSGCCCGGCCCGACGCCCANNHNNNSGCCCGGCCCGACGCC 103997
                                                                non-coding regions of RNAs corresponding to target genes, gene initiation codons, genomic flanking regions, intron-exon borders, the 5'end, the 3'end and the juxta-section between coding and non-coding regions and all segments of RNAs encoding proteins associated with one or more diseases, conditions or mixtures. The antisense oligonucleotides may be derived from sequences x55272-74. These multiple target oligonucleotides (specifically x55180-771) can be used for the antisense treatment of diseases and conditions. Typical diseases and conditions are those associated with impaired respiration and inflammation, including lung diseases, pulmonary vasoconstriction, inflammation, allergic rhinitis, acute asthma, allergies, asthma, impeded respiration, respiratory distress syndrome, pain, cystic fibrosis, pulmonary vasoconstriction, pulmonary vasoconstriction, pulmonary vasoconstriction, including lung diseases, pulmonary vasoconstriction, account of the pulmonary vasoconstriction, and conditions are lunghouses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    respiratory distress syndrome; pain; cystic fibrosis; pulmonary hypertension; pulmonary vasoconstriction; emphysema; chronic obstructive pulmonary disease; leukemia; lymphoma; carcinoma; colon cancer; breast cancer; lung cancer; pancreatic cancer; hepatocellular carcinoma; kidney cancer; melanoma; hepatic metastasis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1510
  metastases, as well as
                                       carcinomas e.g. colon cancer, breast cancer,
                                                        pulmonary disease (COPD), and cancers such as
                                                                                                                                                                                                                                                                                                                                             The specification describes antisense oligonucleotides directed against at least 2 mRNAs selected from target
                                                                                                                                                                                                                                                                                                                                                                                                        Disclosure; Page 37; 120pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                               New antisense oligonucleotides used in treatment of, e.g. pulmonary vasoconstriction
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 1999-229400/19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Nyce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              09-JUN-1998;
17-SEP-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9913886-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     prostate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acute asthma; allergy; asthma; impeded respiration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           umpaired respiration; inflammation; lung disease;
pulmonary vasoconstriction; inflammation; allergic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Antisense oligonucleotide; multiple target; antisense treatment;
impaired respiration; inflammation; lung disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Human adenosine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    05-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           X53491;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (UYEC-) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                25-MAR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 X53491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCAVNNHNNNSGCCCGGCCCGACGCCGCCAVGNNHNNNSGCCCGGCCCGACGCCGCCAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggcacccaacactgcggtgttcgatggcaaccagtgtgtggactctgcggtgatgcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cancer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EAST CAROLINA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98US-0093972
97US-0059160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98WO-US19419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            receptor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 114955
carcinoma, kidney cancer, rall types of cancers which
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  kidney cancer; melanoma; hepatic metastasis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          antisense oligonucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ВP
lung cancer, pancreatic cer, melanoma, hepatic which may metastasize or
                                                        leukemias, lymphomas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      fragment.
                                                                                                                                                                                                                                                                                                                                             genes, coding
                                                                                                                                                                                                                                                                                                                                                                (X52869-X55271)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                103937
                                                                                                                                                                                                                                                                                                                                               and
```

```
Ş
                                                                   밁
                                                                                                 Š
                                                                                                                                     В
                                                                                                                                                                                                        В
                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
   ₽
                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SXXC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 315
   104727
                                                                                                                                       104609
                                                                                                                                                                                                          104549
                                                                                                                                                                                                                                                                          104489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   104309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     104249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      104189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            104011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 103891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   103831
                                                                                                                                                                                                                                                                                                                                                                                                               104369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        104129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               103951
                                   1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          metastasized
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      778
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   / Match 3.7%;
Local Similarity 30.8%;
nes 315; Conservative
                                                                                       ggcagttcaccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggcaacgt 1315
                                                                                                                                                        cagcggcctgggtggccgaccgaccggtccgtcaggtcgcccgttccttagctacg
                                                                                                                                                                                                                                                                                                                                                               gccctcagcgctggaagtacctgaccagtggtctgctgggggctgcagcggcggcgaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gccgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ccgggcsnnndnncbtggcggcgtcgggccgggcsnnndnnbtggcggcgtcggggccggg 104010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgacgccgcaccccgcggcgcgggcgggggctggcaaggtcgtcgtcgtggtgtccaccaccc
                                                                                                                                   cgcbggccbgggcgcgcsnnndnnccgcbggccbgggcgcgcgsnnndnnccgcbg
                                                                                                                                                                                                     ccgcbggccbgggcgcgccgsnnndnnccgcbggccbgggcgcgccgccsnnndnnc
                                                                                                                                                                                                                                     gcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatc
                                                                                                                                                                                                                                                                                                        ccggcgacttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactaca
                                                                                                                                                                                                                                                                                                                                          999cgcgccgccggccgsnnndnnccgcbggccbgggcgcgccgccggccsnnndnnccg
                                                                                                                                                                                                                                                                                                                                                                                                            cggccgggsnnndnnccgcbggccbggcgcgccgccggccggsnnndnnccgcbggccb 104428
                                                                                                                                                                                                                                                                                                                                                                                                                               cggatccacgtggcctgagctacgccgacgcgacgggcaccatcaacgcgctgtaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nnccgcbggccbgggcgccgccggccgggcsnnndnnccgcbggccbgggcgcgccgc 104368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   agtgggtcaaccgctaccacgcctggttgacccgctggtgcagaagccgggtaagacgt 955
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgccgccggccgggccgsnnndnnccgcbggccbgggcgcgccgccgggccsnnnd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggcsnnndnntcgggccgggcsnnndnncgggccgggcsnnndnnccgcbggccbgggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggcsnnndnngcgtcgggccgggcsnnndnncgtcgggccgggcsnnndnngtcgggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ngcggcgtcgggccgggcsnnndnncggcgtcgggccgggcsnnndnnggcgtcgggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        csnnndnntggcggcgtcgggccgggcsnnndnngg--cggcgtcgggccgggcsnnndn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gccgggcsnnndnngtcbtggcggcgtcgggccgggcsnnndnntcbtggcggcgtcggg 103950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gggcsnnndnnccgtcbtggcggcgtcgggccgggcsnnndnncgtcbtggcggcgtcgg 103890
cgcgsnnndnnccgcbggccbgggcgsnnndnnccgcbggccbgggcgsnnndnnccgc
                                                                                                                                                                                                                                                                        cbggccbgggcgccgccggcsnnndnnccgcbggccbgggcgcgccgccggsnnndnn 104548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ttaggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cacgtcgaacaggtctaccggcagttggcccaggactgtgttgaccggatgggcttcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ttcttggccaatatcggtaccgcgttcgccacgggacatggacatggttcgccaagcg
ttcttggccaatggttcgccaagcg
ttcttggccaatggttcgccaagcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        вр;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the
                                                                 -gccsnnndnnccgcbggccbgggcgcgcnnndnnccgcbggccbggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6071 A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Lungs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 s; Score 58.4; DIpred. No. 0.00393; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        including
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29417 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      breast and prostate cancer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        36712 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .0023;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    608;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 114955
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        T; 21427 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                       1255
                                                                                                                                                                                                                                                                                                                                                                              1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        104128
 104786
                                                                                                                                                                                                        104608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     104308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     104248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      104188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          104068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 537
                                                                                                                                                                                                                                                                                                                                            104488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ω
```

```
RESULT
Q35141
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    XXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         104847 bg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          104787
                                                                                                                                                                                                                 WPI; 199
P-PSDB;
                                The sequence given encodes the regulatory (activator) protein srmm. This sequence has the ability in complementation experiments to restore macrolide biosynthetic gene transcription in mutants having defective srmm genes due to insertional inactivation of that region of the S. ambofaciens genome. The srmm gene product activates macrolide biosynthetic gene transcription and may be used to increase the efficiency of macrolide biosynthesis. The translation product of this gene is useful for the generation of antibodies (polyclonal or monoclonal) which are useful in the detection of other macrolide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1376
                                                                                                                                                      Disclosure; Page 3-4; 22pp; English.
                                                                                                                                                                             DNA encoding regulatory activator protein srmR - f biosynthesis to increase efficiency of antibiotic
                                                                                                                                                                                                                                                       Rao
                                                                                                                                                                                                                                                                                                                                                    27-JAN-1993
                                                                                                                                                                                                                                                                                                                                                                           EP524832-A.
                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                            misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        biosynthesis; antibody; polyclonal; monoclonal; pathway;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Regulatory; activator; protein; srmR; complementation experiment; macrolide; biosynthetic; gene; transcription; S. ambofaciens;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q35141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q35141 standard;
                       biosynthetic
                                                                                                                                                                                                                                                                            (ELIL )
                                                                                                                                                                                                                                                                                                    26-JUL-1991;
                                                                                                                                                                                                                                                                                                                            24-JUL-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        srmR coding sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24-MAY-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12
                                                                                                                                                                                                                                                       RN,
                                                                                                                                                                                                                   1993-028879/04
DB; R31041.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ţg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        bggccbgggcsnnndnnccgcbggccbggsnnndnnccgcbggccbggsnnndnnccgc 104846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       acgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgc 1435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1437
                                                                                                                                                                                                                                                                            LILLY &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          104848
                                                                                                                                                                                                                                                      Turner
                      pathways
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ambofaciens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first
                                                                                                                                                                                                                                                                                                      91US-0736178
                                                                                                                                                                                                                                                                                                                            92EP-0306792
                                                                                                                                                                                                                                                      JR;
                                                                                                                                                                                                                                                                            co
                                                                                                                                                                                                                                                                                                                                                                                                                   /*tag= b
/note= "Potential translation initiation
498..500
                                                                                                                                                                                                                                                                                                                                                                                                                                                            459..461
                                                                                                                                                                                                                                                                                                                                                                                                /note= "Potential translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /*rag= a
/note= "Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               345..2312
                                                                                                                                                                                                                                                                                                                                                                                                               /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2312
                                                                                                                                                                                                                                                                                                                                                                                                               C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                  initiation
                                                                                                                                                                                           for macrolide
                                                                                                                                                                              prodn
                                                                                                                                                                                                                                                                                                                                                                                                                                      codon"
```

Query Match
Best Local Similarity
Matches 163; Conserv

Conservative

0;

Score 52.6; DB Pred. No. 0.027; Mismatches 1

184; 14;

Indels Length

Gaps

.0:

2312; 0;

3.48;

Sequence

2312

BP;

342

۸,

862

Ç

782 <u>ن</u> 326 Η,

0

other;

```
RESULT 13
T93095/c
ID 793095;
XX
AC T93095;
XX
DT 11-MAY-1998 (first entry XX
DE Streptomyces frenolicin continuous frenolicin; antibiotic; fix
KW coccidiostatic; efflux put KW coccidiostatic; efflux put KW dehydrase; ketoreductase; FKS
KW dehydrase; ketoreductase; KW ds.
XX
Streptomyces sp.
XX
YX
YX
OS Streptomyces sp.
XX
YX
FF Key
FF CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                       CDS
                                                                                          CDS
                                                                                                                                         CDS
                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1170
                                                                                                                                                                                                                                                                                                                                                                                                                        Frenolicin; antibiotic; feed additive; anticoccidial; coccidiostatic; efflux pump; butyrate starter synthase; cyclase; polyketide synthase; PKS; hemiketalase; ketoreductase; cyclase; dehydrase; ketoreductase; hydroxylase; Streptomyces roseofulvus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cetggeeegeeagetgggegeacegetgateacettegaeggeacee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgcggaccacaccgccgtccccctgctcccgatggtcgcccgcaccc 1485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tcaggtcgccccgttccttagctacgggccagttcaccggatccggccccccgcgatctgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                caaggtcgtcgtggtgtccaccaccacgacccggccactccgtatcagtccggggtaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgcggccgggccgggctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gctcgggcgcccgctcgccgagtacgggaccctgcgccccgtcgcccccacggaactgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccgcaggtccgccgacctccagtcgcacctggtcacgcaggtgatggacaggcgcggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgcggcgtgccgccgggccgagaccggccggccacctccgtggccccgggggtctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgactcgttactcgcgacggccgacggcgaggcggaggcggagccggcctgtgcagccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      frenolicin gene cluster.
                       /product= putative efflux pump
/note= "gene F (specifically claimed)"
9164.10012
/*tag= g
                                                                                                                                                                                                                                                                                          /note= "gen
2945..3916
/*tag= g
/product= transcription activator
/note= "gene G (specifically claimed)"
                                                                                                                                         6533..7183
                                                                                                                                                                                                                                            4020..4844
                                                                                        7344..8897
                                                                                                                                                                                         4841..6415
                                                                                                  /product= unknown non-membrane protein
/note= "gene E (specifically claimed)"
                                                                                                                                                   /product= ATP-binding component of ABC
/note= "gene D (specifically claimed)"
                                                                                                                                                                            /*tag=
                                                                                                                                                                                                     /product= protein with 6 membrane-spanning
/note= "gene C (specifically claimed)"
                                                                                                                                                                                                                              /*tag=
                                                                                                                                                                                                                                                                                                                   /product= 80
                                                                            /*tag=
                                                                                                                               /*taq=
                                                                                                                                                                                                                                                       /note= "gene B
                                                                                                                                                                                                                                                                   /product= membrane
                                                                                                                                                                                                                                                                               /*tag=
                                                                                                                                                                                                                                                                                                                                                           location/Qualifiers
                                                                                                                                                                                                                                                                                                          "gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24379
                                                                                                                            Φ
                                                                                                                                                                                                                                                                                                       kDa non-membrane
A (specifically
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ВP
                                                                                                                                                                                                                                                      (specifically
                                                                                                                                                                                                                                                                                                         e protein claimed)"
                                                                                                                                                                                                                                                       claimed)"
                                                                                                                                                                                                                                                                                                                                                                                                                           roseofulvus;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1456
                                                                                                                                                                transporter
                                                                                                                                                                                                                  domains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1229
 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
Streptomyces frenolicin gene cluster -
                       WPI; 1997-538619/50.
P-PSDB; W34199-W34219.
                                                                                                               07-MAY-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                    (HOFF ) HOFFMANN LA
                                                                                                                                       02-MAY-1997;
                                                                                                                                                                12-NOV-1997
                                                                                                                                                                                        EP806480-A2
                                                              CD,
                                                                                                              96US-0016753
                                                                                                                                       97EP-0107329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product= PKS cl
/note= "gene M (
16120..16371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement (10105..10621)
/*tag= h
/product= translationally coupled to gene
/note= "gene H (specifically claimed)"
complement (10618..11628)
/*tag= i
                                                                                                                                                                                                                                                   /product= quinone-forming hydroxylase
/note= "gene T (specifically claimed)"
complement (22505..22179)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product= acyl carrier protein used by /note= "gene N (specifically claimed)" complement (16453..16935)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product= acyl carrier protein
/note= "gene J (specifically c
complement (12154..13209)
                                                                                                                                                                                                                                                                                                      /product= oxidoreductase
/note= "gene S (specifically
complement (20904...22094)
                                                                                                                                                                                                                                                                                                                                                       /product= cyclase/dehydrase related to /note= "gene R (specifically claimed)" complement (1990..20907)
                                                                                                                                                                                                                                                                                                                                                                                                         /*tag= q
/product= cyclase/dehydrase related to
/note= "gene Q (specifically claimed)"
18895..19839
                                                                                                                                                                                                                /product= not
/note= "gene "
                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product= ketoreductase related to actIII
/note= "gene P (specifically claimed)"
17903..18898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product= putative hemiketal dehydrase
/note= "gene O (specifically claimed)"
//17088..17903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product= PKS ketoacylsynthase subunit
/note= "gene L (specifically claimed)"
14767..16047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product= homologue of fabH
/note= "gene I (specifically
11809..12066
                                                                                                                                                                                                                                          /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "gene K
13409..14686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product= acyltransferase
/note= "gene K (specifically
                                                                                                                                                                                                                                                                                             /*tag=
                                                                                                                                                                                                                                                                                                                                               /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ′*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              '*tag=
                                                                                      ROCHE &
                                                                                                                                                                                                                                          c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   סי
                                                                                       G
                                                                                                                                                                                                                 t specified U"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             chain length factor
M (specifically claimed)"
                                                                                       AG
                                                                                       Ŧ
useful for producing
                                                                                                                                                                                                                                                                                                                   claimed)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 claimed)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   claimed)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      claimed)"
                                                                                                                                                                                                                                                                                                                                                                                                                                    act
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the
                                                                                                                                                                                                                                                                                                                                                                                   actIV
                                                                                                                                                                                                                                                                                                                                                                                                                                      VII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PKS
```

OS Streptomyces roseofulvus. XX FH Key Location/Qualifiers FT CDS 6362948 FT +tag= a /*tag= a /transl_except= (pos:636638,aa:Met)	roseofulvus; frenolicin gene ss.	DT 15-JUL-1998 (first entry) XX DE Strentomyces roseofulyus frenclicin gene cluster	v25925;	RESULT 14 V25925/c ID V25925 standard; cDNA; 24379 BP.	1348 ggcaaggtcgtcgtggtg 1365 	QY 1288 tgcgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgccgggccgggct 1347 II II II II III IIII IIIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Qy 1229 gtcaggtcgcccgttccttagctacgggcagttcaccggatccgccccccgcgat-ctg 1287	QY 1169 gcgtctatgcgccacaccggccgatccagcggcctgggtggccgccgaccaaccggatcc 1228	Qy 1109 acggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccggt 1168	Qy 1049 tgctggggctgcagcggggagggacgccggcgacttgctggtgcttgccgacgacgactatg 1108	Query Match 3.2%; Score 50; DB 18; Length 24379; Best Local Similarity 49.4%; Pred. No. 0.099; Matches 157; Conservative 0; Mismatches 160; Indels 1; Gaps 1;	SQ Sequence 24379 BP; 3077 A; 9792 C; 8499 G; 3011 T; 0 other;	precursors can be converted to frenolicins by chemical or othe methods. The frenolicins can be exidised to frenolicin B, an antibiotic used as an anticoccidial agent. The frenolicins can be converted to the frenolicins can be exident.	Streptomyces sp., particularle encoded proteins. Cells tran be cultured to produce frenol	L, M and N encode polyketide synthases (PKS); R encode a hemiketalase, a ketoreductase and and (5) genes S and T encode a keto/enoyl red hydrolase Also Claimod are yectors bot co	in frenolicin synthesis. The genes can be divided into 5 subclusters: (1) genes A, B, C, D and F encode an efflux pu genes H, I, J and K encode butyrate starter synthases; (3)	sequence comprises containing specific t respectively enco	PT recombinant frenolicin antibiotics XX PS Claim 1; Page 40-60; 66pp; English.
X Y T T T T T T T T T T T T T T T T T T	CDS	CDS	CDS	FT CDS	CDS	FT CDS	CDS	FT CDS	CDS	FT CDS	FT CDS	FT CDS		FT CDS	CDS	FT CDS	FT CDS	FT CDS
/transl_except= (pos:2204022038,aa:Arg) /transl_except= (pos:2203722035,aa:Arg) /transl_except= (pos:2203422032,aa:Thr) /transl_except= (pos:2203422032,aa:Thr) /transl_except= (pos:2203122029,aa:Lys) /note= "encodes protein given in W55819"	/"Lay strengt (pos:2090720905,aa:Met) /transl_except= (pos:2090720905,aa:Met) /note= "encodes protein given in W55818" complement (2090422094) /**rag	"encodes		""""" P /note= "encodes protein given in W55815" 1790318898 /*taq= q	cept= (pos:16 codes protein 03	1612016371 /*tag= n /note= "encodes protein given in W55813" complement (1645316935)	"encodes protein give 16047 m encodes protein give	. 1341	"encodes protein given in nent (1215413209)	/transl_except= (pos:1162811626,aa:Met) /note= "encodes protein given in W55808" 1180912066	<pre>/*Lag= ii /transl_except= (pos:1062110619.aa:Met) /note= "encodes protein given in W55807" complement (1061811628) /*pg= i</pre>	l_ me	/*tag= f /note= "encodes protein given in W55805" 916410012	"rag" e /transl_except" (pos:65336535,aa:Met) /note= "encodes protein given in W55804" 73448897	71	1. 4	48	/note= "encodes protein given in W55800" 29453916 /*tag= b

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 15
T78508
                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
XEXTXAXI
                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 157
                                                                                                                                                                                                                                                                                                                                                                                                                       15044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15104
                                                                                                                                                                                                                                     14864
                                                                                                                                                                              14804
                                                                                                                                                                                                                                                                                                  14924
                                                                                                                                                                                                                                                                                                                                                                                                                                                   1109
                                                                                                                                                                                                         1348
              Platenolide
                                                                                                                                                                                                                                                                                                                                                                                         1169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           and frenolicin or its biosynthetic intermediate is isolated from the culture or the cell; (5) a method for the preparation of frenolicin is by oxidising frenolicin, and (6) a method for the preparation of a feed composition by mixing frenolicin with other components. Frenolicin B is useful as an antibiotic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    connected to an expression control sequence; (2) a host cell transformed by the above vector; (3) a protein coded by the above DNA sequence; (4) a method for the preparation of frenclicin or a biosynthetic intermediate for it in which the above cell is cultured
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                vector containing the frenolicin gene cluster DNA sequence operably connected to an expression control sequence; (2) a host cell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present sequence represents a frenolicin gene cluster from Streptomyces roseofulvus. The present invention describes: (1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 24379 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Frenolicin gene cluster - useful as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         P-PSDB; W55800-W55819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   04-APR-1997;
07-MAY-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               07-MAY-1997;
                                          26-FEB-1998
                                                                                                   T78508 standard; DNA; 44377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 1998-279231/25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JP10094395-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (HOFF ) HOFFMANN LA ROCHE & CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       y Match 3.2%;
Local Similarity 49.4%;
hes 157; Conservative
                                                                                                                                                                                                         ggcaaggtcgtcgtggtg
                                                                                                                                                                                                                                                        tgcgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgcgcgggggct
                                                                                                                                                                                                                                                                                                GTGACGGGCCGCAGACCGTGCTCCCCGCGCGCAGGGTGGCCGCCCACCACTCCTCGGTGCCG
                                                                                                                                                                                                                                                                                                                 gtcaggtcgcccgttccttagctacgggcagttcaccggatccgcccccgcgat-ctg
                                                                                                                                                                                                                                                                                                                                                          GCGTCGAAGTCCGGGACGCCGACGAGTCCACCGGGGTGGCCGCTCGCGTCGTACTCC
                                                                                                                                                                                                                                                                                                                                                                             gcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatcc
                                                                                                                                                                                                                                                                                                                                                                                                                    acggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccggt 1168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TACTCGGGCAGCCGGGCCGGCTCGACGGCGGCGTCCTTCAGTGCCTCGTCGGCGGCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tgctggggctgcagcgcggcagcgacgccggcgacttgctggtgcttgccgacgactatg
                                                                                                                                                                              GGGGCGCCCTGGGCGGTG
                                                                                                                                                                                                                                      AGCCCGTTGGGGGCGGCGACGCCGATGCCGGTGAAGACGGGGGGCAGGGCCGCCCCGGGA 14805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Page 36-44;
          synthase gene cluster.
                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 97US-0042935
96US-0016753
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               97JP-0116652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3077 A; 9792 C; 8499 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           50pp; Japanese
                                                                                                                                                                                                         1365
                                                                                                                                                                              14787
                                                                                                     ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 50; DB 1
Pred. No. 0.099
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ΑG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ŧ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0.099;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            antibiotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 19; Length 24379;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3011 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         μ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                14865
                                                                                                                                                                                                                                                                                                                            1287
                                                                                                                                                                                                                                                                                                                                                                                      1228
                                                                                                                                                                                                                                                                                                                                                          14925
                                                                                                                                                                                                                                                                                                                                                                                                                    14985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15045
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ۳.
```

δõ B

903

caaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggatcc 962

cacctacggcagtgaacgggtgggccgacccgctgtggctgggttcgctgaagtcgaacat 21248

843

Conservative

0;

.15;

353;

Indels

0;

Gaps

0

cyccyccyactycyccyctcyccygcctyccctctygycaccyactcygcccaytnnyt 902

cgaggcgcacggcaccaccgctcggcgacccgatcgaggccggcgcgctgatggc

```
Query Match
Best Local Similarity
Matches 261; Conserv
                                                                           This sequence represents the platenolide synthase gene cluster of the invention. This sequence is referred to as the srmG gene, and was isolated from Streptomyces ambofaciens. This sequence encodes the multi-functional proteins which direct the synthesis of the polyketide platenolide. Platenolide is the basic building block of the macrolide antibiotic spiramycin. The DNA can be used to produce compounds exhibiting antibiotic activity based on the platenolide structure, including specifically the macrolide antibiotic spiramycin and spiramycin analogues and derivatives. Modifications of the platenolide synthase DNA sequence can be made so as to change the number and type of carboxylic acids incorporated into the growing polyketide chain and to change the kind of post-condensation processing that is conducted.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                       Claim 9;
                                                                                                                                                                                                                                                                                              WPI; 1997-418047/39.
P-PSDB; W23716-W23720.
                                                                                                                                                                                                                                                                                                                                             Burgett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Streptomyces ambofaciens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Platenolide synthase gene cluster; platenolide production; srmG gene; multi-functional protein; macrolide antibiotic; spiramycin; ss.
                                                           Sequence 44377 BP;
                                                                                                                                                                                                                                                                                                                                                                                           22-FEB-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                 19-FEB-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                        27-AUG-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                EP791656-A2
                                                                                                                                                                                                                                                                                                                                                                    (ELIL ) LILLY
                                                                                                                                                                                                                                                             production
                                                                                                                                                                                                                                                                                                                                   SG,
                                                                                                                                                                                                                                    Pages 8-33; 81pp;
                                                                                                                                                                                                                                                          Streptomyces ambofaciens on of spiramycin-related
                                                                                                                                                                                                                                                                                                                                             Kuhstoss
                                                                                                                                                                                                                                                                                                                                                                    & CO ELI.
                                                                                                                                                                                                                                                                                                                                                                                           96US-0012050
                                                                                                                                                                                                                                                                                                                                                                                                                 97EP-0301066
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_except=
/note= "ORF3 enc
31329..36071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note=
31329..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "ORF2
20110..31284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "ORF1
14046..20036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            36155..41830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       transl_except=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            350..1400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "ORF4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ′*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     *tag=
                                                          4965 A; 15552 C; 17381 G;
            3.2%;
                                                                                                                                                                                                                                                                                                                                             SA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "ORF5
                                                                                                                                                                                                                                                                         ambofaciens
                                                                                                                                                                                                                                      English
                                                                                                                                                                                                                                                                                                                                             Rao
Score 49.2; DI
Pred. No. 0.15
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          encodes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            encodes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       encodes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        encodes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         encodes
                                                                                                                                                                                                                                                                                                                                             RN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (pos:350..352,
                                                                                                                                                                                                                                                                                                                                             Richardson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      :20111..20113,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein shown
                                                                                                                                                                                                                                                            platenolide synthase domain polyketide antibiotics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein shown
                         DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          shown
                                                           6479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        shown
                       18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aa:Met)
                                                                                                                                                                                                                                                                                                                                             MA
                                                           Ή.
                       Length 44377;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aa
in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in W23717"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in W23719"
                                                           0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           :Met)
W23718"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             W23716"
```

```
뮵
                       ğ
                                                 밁
                                                                     δÃ
                                                                                                 Ъ
                                                                                                                     Q
                                                                                                                                               밁
                                                                                                                                                                                                  8
                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                      ρy
                                            21729 catcggccacgccc 21742
                                                                                             21489 ggaaccgcccgcggccggtgacacctcgcccgccggcgacacccctgagccgggcgaggc 21548
                                                                                                                                                                                                                                             21429 ccggcgggccgcggtctccgccttcggcgtcagcggcaccaacgcccacgtcatcatcga 21488
                                                                                                                                                                                                                                                                                              21369 cgcgggcgccgtgcaactgctcaccggcgtccggccatggccccggcgcgagcacaggcc 21428
                                                                                                                                                                                                                                                                                                                                              21309 gcagtccgagctgccgcgcaccctgcacgtcgacgccctcggccaaggtcgaatggga 21368
                                                                                                                                                                                                                                                                                                                                                                                              1443 cttcgacggcaccc 1456
                                                                                                           1203 ctgggtggccgccaacggatccgtcaggtcgcccgtttccttagctacgggcagtt 1262
                                                                                                                                                                                                                                                                1143 ccaggacgcgttcaacgcggtccggtctatgcgcccacaccggccgatccagcggc 1202
                                                                                                                                                                                                                                                                                                                                                             1263 caccggatccgcccccgcgatctgtggcgctgtggccggtgccggcaacgtcgacgcc 1322
                                                                                                                                                                                                                                                                                                             1083 cttgctggtgcttgccgacgactatgacggccggggatgcagacggggcactacagcaacga 1142
```

Search completed: January 12, 2001, 20:05:55 Job time: 26239 sec

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           btal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GenEmbl:*
1: 9b_bal:
2: 9b_bal:
3: 9b_om:*
4: 9b_ov:*
5: 9b_ph:
6: 9b_ph:
7: 9b_pl:
7: 9b_pl:
9: 9b_pr:
9: 9b_pr:
    110.
1113.
113.
113.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
1154.
115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   January 12, 2001, 19:59:14; Search time 6876.06 Seconds (without alignments) 1161.085 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1118133 seqs, 2558875100 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-461-774-3
1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 gcggccatgtggcgccgcag.....gtctgcggtgcgcgccctga 1560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gb_ba1: *
gb_ba2: *
gb_ow: *
gb_ov: *
gb_ph: *
gb_pl1: *
gb_pr1: *
gb_pr2: *
gb_pr3: *
gb_ro:*
gb_un:*
gb_un:*
em_fun:*
em_hum2:*
em_on:*
em_on:*
em_or:*
em_ov:*
em_ov:*
em_ph:*
em_ph:*
em_ph:*
em_ph:*
em_ph:*
em_ph:*
em_ph:*
em_ph:*
em_bi:*
em_bi:*
em_un:*
em_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2236266
```

76: 77: 78: 79: 80: 81: 82: 83:	777776666666662 77777668765432 774321100000000000000000000000000000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
nd land		em_htg2:* em_htg3:* em_hum5:* gb_p13:* gb_p15:* gb_htg9:* gb_htg10:* gb_htg11:* gb_htg11:* gb_htg11:* gb_htg17:* gb_htg17:* gb_htg17:* em_htg4:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

																					יד
	Ω		C	O				ი	C				C	C	C					C	Result
21	20	19	18	17	16	15	14	13	12	11	10	9	œ	7	δ	υ	4	ω	N	بس ا	ult
66	66.2	69	79.4	105.4	113.2	113.2	113.2	127.8	134.6	158.2	158.2	158.2	185.2	187.4	265.2	265.2	265.2	265.2	908.6	1553.6	Score
4.2	4.2	4.4	5.1	6.8	7.3	7.3	7.3	8.2	8.6	10.1	10.1	10.1	11.9	12.0	17.0	17.0	17.0	17.0	58.2	99.6	Query Match
38634	4583	123580	14866	26555	2295	1908	1908	31360	36583	1973	1777	1777	41800	38366	40544	1821	1820	1820	36404	38110	Query Match Length DB
73	73	\vdash	73	73	73	81	81	73	73	73	81	81	73	73	73	81	81	73	2	2	B
SC26G5	SMASFUABC	AF263912	SC1B5	SC2G1	STMTRIP	138959	AR027257	SC9C7	SC5H1	STMSLPE	138961	AR027259	SCD8A	SC23B6	SCH5	AR027260	I38962	STMSLPD	MSGB32CS	MTCY427	ID
AL359152 Streptomy	M33815 S.marcescen	AF263912 Streptomy	AL023517 Streptomy	AL391014 Streptomy	L27466 Streptomyce	I38959 Sequence 1	AR027257 Sequence	AL035161 Streptomy	AL049863 Streptomy	L42759 Streptomyce	I38961 Sequence 5	AR027259 Sequence	AL160331 Streptomy	AL390968 Streptomy	AL035636 Streptomy	AR027260 Sequence	I38962 Sequence 7	L42758 Streptomyce	L78818 Mycobacteri	z70692 Mycobacteri	Description

	REFERENCE 1 (bases 1 to 38110) AUTHORS Cole,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C., Harris,D., Gordon,S.V., Eiglmeier,K., Gas,S., Barry III,C.E., Tekaia,F., Badcock,K., Basham,D., Brown,D., Chillingworth,T., Connor,R., Davies,R., Devlin,K., Feltwell,T., Gentles,S., Hamlin,N., Holroyd,S., Hornsby,T., Jagels,K., Krogh,A., McLean,J., Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A., Rajandream,M.A., Rogers,J., Rutter,S., Seeger,K., Skelton,S., Squares,S., Sqares,R., Sulston,J.E., Taylor,K., Whitehead,S. and Barrell,B.G. TITLE Complete genome sequence OURNAL Nature 393 (6685), 537-544 (1998) MEDLINE Braatum:[[published erratum appears in Nature 1998 Nov 12;396(6707):190]] REFERENCE 2 (bases 1 to 38110)	RESULT 1 MTCY427/c LOCUS DEFINITION Mycobacterium tuberculosis H37Rv complete genome; segment 99/162. ACCESSION Z70692 AL123456 VERSION Z70692.1 GI:3261567 KEYWORDS SOURCE Mycobacterium tuberculosis. ORGANISM Mycobacterium tuberculosis Bacteria; Firmicutes; Actinobacteridae; Actinobacteridae; Actinobacteridae; Actinobacteridae; Actinobacteridae;	22 65.2 4.2 6633 71 HEHSYIG3 C 23 65.2 4.2 12001 81 ARO48721 C 24 65.2 4.2 12001 81 ARO48721 C 25 65.2 4.2 26245 72 HSIUS C 25 65.2 4.2 152261 71 HEICG C 26 65.2 4.2 152261 71 HEICG C 27 65.2 4.2 152261 71 HEICG C 28 62.6 4.0 135301 71 BHVICGEN C 30 62.6 4.0 135301 71 BHVICGEN C 31 59.2 3.8 10798 1 AEOU149 S 32 59.2 3.8 10798 1 AEOU149 S 35 56.2 3.6 2764 72 HSBBICP4B C 37 55.6 3.6 16185 73 SCC121 C 38 55.8 3.6 5635 1 AF145039 C 40 54.6 3.5 1235 1 AF187997 C 40 54.6 3.5 1235 1 AF187997 A 54.6 3.5 12928 1 AEOU5076 A 54.2 3.5 2028 47 SSI132828 A 54.3 3.5 36368 73 SCC3A1 A 55.0 36368 73 SCC3A1 A 56.0 36.0 36.0 36.0 36.0 36.0 36.0 36.0 3
CDS	ce _feature _feature	contains P800180 G Glutamine syntheta signature, P800180 G Glutamine syntheta signature, P800182 adenylation site" /codon_start=1 /transl_table=11 /product="glna!" /protein_id="CAA94 /db_xref="GI:32615 /db_xref="SWISS-PR /translation="MTGS SYFDDGLAFDGSSIRGFQ PYSRDPRIARRAENYLI WWNTGAATEADGSPNRGY	implemented in TBparse (Kro of positional base preferen an increase in the observed CAUTION: In some cases we initiation codon. Where po (atg, gtg, or ttg) which is binding site sequence (opti codon). If this cannot be initiation codon. FEATURES I38110 /organism="Mycobac/strain="H37Rv" /db_xref="taxon:17 source /strain="H37Rv" /db_xref="taxon:17 clone="y190" gene /gene="glnAl" CDS /gene="glnAl" /note="Rv2220, (MT Probable glutamble

```
implemented in Tigarsa (Kroph) supplemented with visual inspection of positional base preference in codons, sepecially where there is an increase in the observed/sepecial bird position of c. C. CAUTION: In some cases we may not have predicted the correct intrinction codon; because in the observed/sepecial bird position of c. C. CAUTION: In some cases we may not have predicted the correct intrinction codon; bird position of codon; bird position; b
```

```
three proteases/peptidases from Streptomyces spp.: L42758, L42759, L27466. FASTA score: L42758|STMSLPD STMSLPD NID: 9940302 - Streptomyces (539 aa) opt: 1032 E(): 0, (37.5% identity in 533aa overlap). Also similar to hypothetical proteins SW:YZZE_ECOLI P34211 (25.4% identity in 406 aa overlap) and PIR:B36944 in ompp 3' region (27.5% identity in 218 aa overlap).Highly similar to to MTCY427.05c (49.3% identity in 507 aa overlap); contains PS00120 Lipases, serine active site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VEVRSPDSACNPYLTFAVLLAAGLRGVEKGYVLGPQAEDNVWDLTPEERRAMGYRELP SSLDSALRAMEASELVAEALGEHVFDFFLRNKRTEWANYRSHVTPYELRTYLSL" 6349. 6366 // Complement (6385. 7947) // Gene="Rv2233c" // 1947) // 1968 // 1947 // 1947 // 1968 // 1947 // 1948 // 1947 // 1948 // 1947 // 1948 // 1947 // 1948 // 1947 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 // 1948 //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="glnA2"
/protexn_id="CaA94645.1"
/protexn_id="CaA94645.1"
/db_xref="GG:1261924"
/db_xref="GG:1261924"
/db_xref="GG:1261924"
/db_xref="SWISS-PROT:Q10378"
/translation="MDRQKEFVLRTLEERDIRFVRLWFTDVLGFLKSVAIAPAELEGA FEEGIGFDGSSIEGFARVESDOTVAHPDDPSTFQVLPWATSSCHHHSARWFCDITMPDG FEEGIGFDGSSIEGFARVESDOTVAHPDEIEFFLLKPGPEDGSVPVPVDNAGYFDQA VPDSALWFRRHAIDALEFMGISVEFSHESDAPQACEIDLFRADALSMADNWTFRYVIKEVALEGGARASFMFKPEFGQHEGSAMMTHMSLFEGDVNAFHSADDPLOLSEVGKSTA KEVALEGGARASFMFKPEFGGHEGSAMTHMSLFEGDVNAFHSADDPLOLSEVGKSTA GILEHACEISAVTNOMVNSYKRLVQGGEAPTAASWGAANRSALVRVPMYTPHKTSSRR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv2222c, (MTCY427.03c), len: 446. glnA2, probable gln2, (overlaps MTCY190.33c partial sequence) probable classII glutamine synthetase, similar to MTCY190.31 (and partialorf MTCY427.01) (34.3% identity in 300 aa overlap)"/codon_start=1
                                                                                                                        /db_xref="SWISS-PROT:Q10508"
/translation="MAAMWRRRPLSSALLSFGLLLGGLPLAAPPLAGATEEPGAGQTP
/translation="MAAMWRRRPLSSALLSFGLLLGGLPLAAPPLAGATEEPGAGQTP
GAVVAPQQSWNSCREFIADTSEIRTARCATVSVPVDVDQPGGTQAKLAVIRVPATGQ
REGALLVNPGGPGASAFIADTSAIADTDILRHFDLVGFDPRGVGHSTPALRCRTD
AEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMOWVR
QALGDDQINYLGYSYGTELGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(4950..6290)
/gene="glnA2"
complement(4950..6290)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LSEALATESWYLATLROKPAVAKRLMHYLGTSAYVPDLLMRAPRVIQQYEDGPAGPKL
LETEPAAVARALIASASRYPDPERAIAGARTLRRELARIGSADLLGLLEVTEVCRAL
TSVWYAVLQAALDVMIRASLPODDRAPAAIAVIGMGRLGGAELGYGSDADVMFYCEPA
TGVDDARAVKWSTSIAERVRALLGTPSVDPPLELDANLFPERGPLVRTLGSYAAYY
EQWAQPWEIQALLRAHAVAGDAELGQBFLRWVDKTRYPDGYSADSVBEIRRIKARIE
SERLPRGADPNTHTKLGRGGLADIEWTVQLLQLQHAHQVPALHNTSTLQSLDVIAAAD
LVPAADVELLRQAWIJATRARNALVLVRGKPTDQLPGPGRQLNAVAVAAGWRNDDGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RTLESHIAYYORWAKTWEFQALLKARPVVGDAELGERYLTALMPMVWRACEREDFVVE VQAMRRRVEOLVPADVEGRELKLGSGGLRDVEFAVQLLQLVHARSDESLRVASTYDAL AALGEGGY IGREDAAMMTASY EFLRLLEHRLQLQRLKRTHLLPDPEDEEAVRWLARAA HIRPDGRNDAAGVLREELKKQNVRVSKLHTKLEYQPLLESIGFTGLEIAHGMTLEAAG RRLAALGYEGPQTALKHMSALVNQSGRRGRVQSVLLPRLLDWMSYAPDPDGGLLAYRR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MVVTKLATQRPKLPSVGRLGLVDPPAGERLAQLGWDRHEDQAHV DLLWSLSRAPDADALRALIR.ESSLEGSSLAIG DLLWSLSRAPDADALRALIR.ESSLEQVDTGWDELNAALLRERSLEGSKESVLGSSLAIG DHLVAHPQSWKLLRGKVTLPSHDQLQRSFVECVEESEGMPGSLVHRLRTQYRDYVLML AALDLAATVEDEDPVLPTVVAARLADADADALAAALRVAEASVCGEHPPERLAVLAMG KCGARELNYVSDVDYIFVAERSDPRNARVASEMMRVASAAFFEVDAALRPEGRNGELV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="Rv2223c" /gene="Rv2223c" /gene="Rv2223c, (MTCY427.04c), len: 520. Probable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="hypothetical
/protein_id="CAA94646.]
/db_xref="GI:1261925"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 exportedprotease, has signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FLDNYLRVTRRÅKAVVRKVFGS"
INALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCV
                                                            TAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="glnA2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="SWISS-PROT:Q10379"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      al protein .
5.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence. very similar to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rv2223c"
```

CDS

gene

misc_feature

```
Ş
                                                 B
                                                                        δÃ
                                                                                                 Вþ
                                                                                                                        ρy
                                                                                                                                                    Вp
                                                                                                                                                                        ρ
                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 1556;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                    7284
                                                                                                                                                                                                      7404
                                                                                                                                                                                                                                                         7464
                                                                                                                                                                                                                                                                                                                                                             7584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                7704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7824
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                             7644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7944 GCGGCCATGTGGCGCCGCAGACCGTTGAGCTCGGCGCTGCTGTTCCTTCGGGTTGCTGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           misc_feature
                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 gcggccatgtggcgccgcagaccgttgagctcggcgctgctgcttcgttccttcgggttgctc
            gttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgac 840
                                                              ctggaacggttcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagcc
                                                                                                  ttggccaatatcggtaccgcgtccgtcgcacgggacatggacatggttcgcccaagcgtta
                                                                                                                                                                                                                  9tcgaacaggtctaccggcagttggcccaggactgtgtttaaccggattgggcttcagcttc
                                                                                                                                                                                                                                                                    gtcgccgctatggcacccgcgatcgccgacaccgacattctccgccacttcgacctggtg
                                                                                                                                                                                                                                                                                                                                                                                                             CAGCGATTCGGAGCACTGCTGGTCAATCCTGGGGGACCCGGGGCGTCGGCGGTCGACATG
                                                                                                                                                                                                                                                                                                                                                                                                                            cagcgattcggagcactgctggtcaatcctgggggacccggggcgtcggcggtcgacatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                               TACGACCAACCCGGTGGGACACAAGCGAAGTTGGCGGTGATCCGCGTCCCCGCGACGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tacgaccaacccggtgggacacaagcgaagttggcggtgatccgcgttccccgcgacggga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAAACCCCGGGTGCGCCGGTCGTGGCGCCGCAACAGGTTGGAACAGCTGCCGCGAGTTC 776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggcggactgctcctagcagcgcccccgttggccggcgcgactgaagaacccggcgccggc 120
 GTTAGCCCAATCGAGGAAAGCATCAGCCAAATGGCGGGATTTCAGACCGCTTTCAATGAC
                                                                                                                                                    TTGGCCAATATCGGTACCGCGTCCGTCGCACGGGACATGGACATGGTTCGCCAAGCGTTA
                                                                                                                                                                                                      GTCGAACAGGTCTACCGGCAGTTGGCCCCAGGACTGTGTTGACCGGATGGGCTTCAGCTTC
                                                                                                                                                                                                                                                        GGCTTCGACCCGAGAGGGGTCGGCCACTCGACCCCTGCGTTGCGGTGTCGCACCGACGCC
                                                                                                                                                                                                                                                                                                                                                            GTCGCCGCTATGGCACCCGCGATCGCCGACACCGACATTCTCCGCCACTTCGACCTGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(8009. .9571)
/gene="Rv2224c"
complement(8009. .9571)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="GGTGA,
Rv2223c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="PS00120 Lipases,
complement(7952..7956)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(7243. .7272)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTLPPTSLRCAP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKVVVVSTTHDPATPYQSGVDLARQLGAPLITFDGTQHTAVFDGNQCVDSAVMHYFLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="Rv2224c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="Rv2223c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 1553.6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      possible ribosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 serine active site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .2e-205;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       binding site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0:
                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                 7225
                                                                                                                                                    7285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                7645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7705
                                                                                                                                                                             660
                                                                                                                                                                                                      7345
                                                                                                                                                                                                                                                                                540
                                                                                                                                                                                                                                                                                                         7465
                                                                                                                                                                                                                                                                                                                                                                                                             7585
                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                          780
                                                                                                                          720
                                                                                                                                                                                                                              600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
```

```
DЬ
                                                                                                             REFERENCE
AUTHORS
                                                                                                                                                                                                          VERSION
KEYWORDS
                                                                                                                                                                                                                                                       SULT
MSGB32CS
LOCUS
                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                                                                  Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                 REFERENCE
                                                                                                                                                                                               SOURCE
                                                                                                                                                                                                                                  ACCESSION
                                                                                                TITLE
                                                              MEDLINE
                                                                                                                                                                       ORGANISM
                                                                         JOURNAL
                                      AUTHORS
                                                                                                                                                                                                                                                                                                                    6444
                                                                                                                                                                                                                                                                                                                                          1501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1201
                                                                                                                                                                                                                                                                                                                                                                                        1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1021
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          901
                                                                                                                                                                                                                                                                                                                               gtgatgcactattttctcgacgggaccttgccgccgacgagtctgcggtgcgcgccctga
                                                                                                                                                                                                                                                                                                                                                                                                             ccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgctgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccgcaccccgcggccggccgggctggcaaggtcgtcgtcgtggtgtccaccaccacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gacttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactacagcaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccacgtggcctgagctacgccgacgcgacgacgggcaccatcaacgcgctgtacagccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gtcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcggat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTGATGCACTATTTTCTCGACGGGACCTTGCCGCCGACGAGTCTGCGGTGCGCCCCTGA
                                                                                                                                                                                                                                                                                                                                                                          ttcaccggatccgccccccgcgatctgtgcgcgctgtggccggtgccggcaacgtcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacgggcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cagcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcggcgaccgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTCACCGGATCCGCCCCCCGCGATCTGTGCCGCGTGCCGGTGCCGGCAACGTCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCTGGGTGGCCGACCAACGGATCCGTCAGGTCGCCCCGTTCCTTAGCTACGGGCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CAGCGCTGGAAGTACCTGACCAGTGGTCTGCTGGGGCTGCAGCGCGGCAGCGACGCCGGC
                                                                                                                                                                                                                                                                                                                                                               ACCTTCGACGGCACCCAACACTGCGGTGTTCGATGGCAACCAGTGTGTGGACTCTGCG
                                                                                                                                                                                                                    Mycobacterium
L78818
L78818.1 GI:1
2 (bases 1 to 36404)
Smith,D.R., Richterich,P., Rubenfield,M., Butler,C., Lee,H.-M., Xu,Q., Gunderson,K., Chung,M., Maher,J.K., Deloughery,C., Aldrich,T., Imrich,J., Tulig,C., Smyth,A., Drill,S., Avruch,A.S. Rice,P., Abendschan,K., Aldredge,T., DeLoughery,C., Kirst,S.,
                                                                      Eiglmeier, K., Honore, N., Use of an ordered cosmid of Mycobacterium leprae Mol. Microbiol. 7 (2), 19
                                                                                                                                                                  Mycobacterium leprae 6) DNA.
Mycobacterium leprae
                                                                                                                                   Mycobacterium.
                                                                                                                                                Actinomycetales;
                                                                                                                                                          Bacteria; Firmicutes;
                                                                                                                                                                                                                      GI:1377778
                                                                                                                                                                                                                                                        36404
                                                                                                                                                                                                                                          6404 bp
leprae
                                                                                                                                            ites; Actinobacteria; Actinobacteridae;
Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                            DNA
cosmid
                                                                                                                                                                                               (clone:
                                                                         197-206
                                                                                             Woods, S.A.,
                                                                                                                                                                                                                                            в32
                                                                                                                                                                                              cosmid
                                                                      (1993)
                                                                                                                                                                                                                                            BCT
DNA sequence
                                                                                                deduce the
                                                                                                                                                                                              в32)
                                                                                                                                                                                              (tissue
                                                                                                genomic
                                                                                                            and
                                                                                                                                                                                               library:
                                                                                                                                                                                                                                                        15-JUN-1996
                                                                                                          Cole,
                                                                                                organization
                                                                                                                                                                                                                                                                                                                                         1560
                                                                                                                                                                                                                                                                                                                  6385
                                                                                                                                                                                                                                                                                                                                                                6445
                                                                                                                                                                                                                                                                                                                                                                                       1500
                                                                                                                                                                                                                                                                                                                                                                                                              6505
                                                                                                                                                                                                                                                                                                                                                                                                                                     1440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6865
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6985
                                                                                                                                                                                                                                                                                                                                                                                                                                                            6565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6625
                                                                                                                                                                                               Lorist
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7045
```

```
TITLE
JOURNAL
COMMENT
В
                      QΥ
                                                  В
                                                                           Š
                                                                                                    밁
                                                                                                                              Š
                                                                                                                                                       B
                                                                                                                                                                                 δõ
                                                                                                                                                                                                          В
                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                             Db
                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                               BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                          14251
 14431
                                                                                                                                                                                                           14191
                                                                                                                                                                                                                                                             14131
                                                                                                                                                                                                                                                                                                               14071
                                                                                                     14311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                         494
                                                                                                                                                                                                                                    254
                                                                                                                                                                                                                                                                                      194
                                                                                                                                                                                                                                                                                                                                                                1103;
                                                 cgccggtcgtggcgcgcaacagagttggaacagctgccgcgagttcatcgccgacacca
             accggcgcgatccgatggccgactacagtccggccggcgtcaccccacgtcgaacaggtct
                                                                                                     TACCAGGGCTACAACGTACCGATATTGGCCGTCACTTCGACCTGGTGGGGGTTCGACCCGC
                                                                                                                  cacccgcgatcgccgaccacccgacattctccgccacttcgacctggtgggcttcgacccga
                                                                                                                                                                    cactgctggtcaatcctgggggacccgggggctcggccggtcgacatggtcgccgctatgg
                                                                                                                                                                                                          ATGGGGTGCACGCCGAATTGGCGGTCATCCGCGCTCCAGCGACTGGCCAGCGGATCGGAT
                                                                                                                                                                                                                         gtgggacacaagcgaagttggcggtgatccgcgcgtccccgcgagggacagggattr;jgag
                                                                                                                                                                                                                                                             GCGACATCCCCTCGGCACGGTGTGCAACGGTGTCGGTGCCGGTCGACTACAACAATCCTG
                                                                                                                                                                                                                                                                         gcgaaattcgcactgcacgctgcgcgacggtgtccgtccccgtcgactacgaccaacccg
                                                                                                                                                        CGCTGCTGTTCAATCCGGGAGGACCCGGGGGCGTCCGCGGTTGACATGGTCGCCGAAATGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       suggested
start
site diffe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Safer, H., Connelly, S., McDougall, S., Eiglmeier, K., Bergh, Cole, S., Robison, K., Jaehn, L., Gryan, G., Church, G.M. and Prepublication submission Unpublished (1996)

This sequence was generated by the Genome Sequencing Cent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   another
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     insert of a constructed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the
                                                                                                                                                                                                                                                                                                                                                               Similarity 77.3
03; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the presence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           homology,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      to locate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the basis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         clone.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 insert of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Beaver St., Waltham, (smith@cric,com) for
                                                                                                                                                                                                                                                                                                                                                                                                                                           6892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       differs from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Therapeutics
                                                                                                                                                                                                                                                                                                                                                                                                                                      /clone="cosmid B32"
/tissue_lib="Lorist 6"
/note="The liver of the a
Mycobacterium leprae."
a 10050 c 11480 g 7982
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Mycobacterium
/specific_host="Dasypus :
/db_xref="taxon:1769"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nce of a Shine-Dalgarno translational coupling.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the most probable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sequence may not represent the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  from M. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                overlapping region was
                                                                                                                                                                                                                                                                                                                                                                            58.2%;
77.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sequences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              usage and homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Corporation
                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MA, 02154. Please confurther information.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       one
                                                                                                                                                                                                                                                                                                                                                               Score 908.6; DB 2;
Pred. No. 5.7e-117;
0; Mismatches 324;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                coupling.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     02154.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         larger than
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        selected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  genomic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  clone from a mapped
genomic DNA isolated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      start site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the Genome Sequencing (Collaborative Resea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sequence,
. It is po
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     n leprae"
novemcinctus"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Please contact Doug ormation. The sequen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   armadillo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                previously sequenced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               information.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      based
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               e, or overlapping possible that the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entire
                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     used
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Research Div
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    set of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cloned insert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       codon
                                                                                                                                                                                                                                                                                                                                                                                          36404;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bergh, S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               An attempt was
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         were
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     armadillo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Smith
                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       usage,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                clones
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     isolate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           represents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Division),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mao, J.
                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            orf that
                                                                             493
                                                                                                                               433
                                                                                                                                                                                                                                                                                                                                       193
                                                                                                                                                        14310
                                                                                                                                                                                                                                                             14190
                                                                                                                                                                                                                                                                                                               14130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  actual
 14490
                                                    14430
                                                                                                       14370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16
                                                                                                                                                                                                                                                                                                                                                                  0;
```

δÃ

accggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaatatcg

```
RESULT
STMSLPD
                                                                                                                                                                                                                                                                                                                       do
                                                                                                                                                                                                                                                                                                                                                                             ДЪ
                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                               밁
                                                                                                                      Qy
                                                                                                                                                    밁
                                                                                                                                                                             Ωy
                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                        δō
                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Дb
              DEFINITION
                           LOCUS
                                                                                               15451
                                                                                                                                                                                                                                                                                                                                                                              15151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14671
                                                                                                                                                                                                                                                                                                                                                                                                                                     15091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14491
                                                                                                                                                                                                                                                                                                                                                 1274
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1094
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1034
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            854
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     614
                                                                                                                                                                                                                       atcagtccggggtagacctggcccgccagctgggcgcaccgctgatcaccttcgacggca
                                                                                                                                                                                                                                                                                                                                    ccccccgcgatctgtgcgcgctgtggccggtgcggcaacgtcgacgccgcacccccgcgg
                                                                                                                                                                                                                                                                                                                                                                                           ccgaccaacggatccgtcaggtcgcccgttccttagctacgggcagttcaccggatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcgccggctcgcctgccctctgggcaccgactcggcccagtgggtcaaccgctacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TCGTGGACGAGACGTTGCTACCGGCGTCCTTACAATGTCAGCCCTAA
                                                                                                            ttctcgacgggaccttgccgccgacgagtctgcggtgcgcgccctga 1560
                                                                                                                                                                                                                                                                              CCGATCAGCAGATACGCCAGGCCGCTCCGTTCCTCAACTACGGGCAATTCACCGGCAACG
                                                                                                                                                                                                                                                                                                                                                                                                                                    TTAACGCGATCCGCTGCGTCGACGCGCCGGTGCCAACCGACTCGGCGAGCTGGGTATCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                  tcaacgcggtccggtgcgtctatgcgcccacaccggccgatccagcggcctgggtggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             acctgaccagtggtctgctgggggctgcagcggggacgcagcgacgcggcgacttgctggtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCTACGCTGACGCGACCACCGGCACCATTAATGCGCTCTACACCCCGGTGCACTGGAAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gctacgccgacgcgacgggcaccatcaacgcgctgtacagccctcagcgctggaagt 1033
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATGCGCTGATCGACCCGTTGGTTACCAAGCCGGGTCGGACGTCGGATCCACGCGGCCTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acgccctggttgacccgctggtgcagaagccgggtaagacgtcggatccacgtggcctga 973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCGCCCGCTCGGCGTCCTGTCCACTGGGCACTGACCCCAGCCAATGGGTCAACCGATACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGAAAGACATCCAGCAAATGGCCGGATTCCAGATCGCATTTACCGACTATGCCGCGGACT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccgact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCGACCATGTGCGGGCGATGGTGCTTGACGGCGCTATTGACCCGAGTGTTAGCTCAATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gtactcatgtgcgggcgatggtcctcgaccggcgctatcgatccagccgttagcccaatcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAACTGCCTCGGCCGCGCGCGACATGGATATAGTTCGCCTGGCTCTGGGAGACGAGCAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCCAGCACACCGCGGTGTTCAACGGCGACCAGTGTGGATAGCGCGCGGTGGTGCATTATT
                                                                                                                                                                 cccaacacactgcggtgttcgatggcaaccagtgtgtggactctgcggtgatgcactatt 1513
                                                                                                                                                                                                          ATCAGGCCGGGGTAGACCTGGCTCGCGAGCTGAGCAGCCCGCTGGTCACCTACGACGGAA
                                                                                                                                                                                                                                                                  CGCCGGTCGCCGGGCAAGGTTGTCGTGGTCTCCACAACGCACGACCCGGCCACTCCAT
                                                                                                                                                                                                                                                                                                                       CTCCCCGCGATATCTGTGCACTGTGGCCGGTGCCGGCGACATCGATGCCGCACCCCGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACCTGACCAGTGGCTTGCTTGGGCTGCAGCGTGACCGACGCCGGTGACCTGCTATTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatcaga
STMSLPD
Streptomyces
cds.
            1820 bp
lividans
                           1820
            (clone
            p5-6)
            proteinase
           28-MAR-1996
(slpD) gene, cor
                                                                                                                                                                                                          15390
                                                                                                                                                                                                                                                                                            1393
                                                                                                                                                                                                                                                                                                                                                                                                                                                              1213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14670
                                                                                                                                                                                                                                    1453
                                                                                                                                                                                                                                                                                                                                                 1333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14610
                                                                                                                                                                                                                                                                                                                                                                             15210
                                                                                                                                                                                                                                                                                                                                                                                                        1273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                15030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14550
            complete
                                                                                                                                                                                                                                                                 15330
                                                                                                                                                                                                                                                                                                                       15270
                                                                                                                                                                                                                                                                                                                                                                                                                                    15150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     673
```

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACCESSION
VERSION
                                  Qy
                                                                         DЬ
                                                                                                           Qy
                                                                                                                                                    В
멍
                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 788; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                             terminator
351
                                      197
                                                                             291
                                                                                                               137
                                                                                                                                                      231
                                                                                                                                                                                            77
GCGTCCCGGGCTTCCAGTGCGCCACCATGAAGGCCCCGCTCGACTACGCCAAGCCCGCCG
                                                                                                                                                    aaattcgcactgcacgctgcgcgacggtgtccgtcccgtcgactacgaccaacccggtg
                                                                           AGGCCACGCCCGAGCTGTCCCCCGTACTACGAGCAGAAGCTCGGCTGGCGCGACTGCG
                                                                                                       cggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               proteinase; slpD gene.
Streptomyces lividans (strain 66) (clo
Streptomyces lividans
Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Binnie, C., Butler, M.J., Aphale, J.S., Bourgault, R., Dizonno, M.A., Krygsman, P., Liao, L., Walczyk, E. and Malek, L.T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                L42758
L42758.1 GI:940302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             associated with the mycelium of Streptomyces J. Bacteriol. 177 (21), 6033-6040 (1995)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96042075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Isolation and characterization of two genes encoding proteases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Actinomycetales; Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 1820)
                                                                                                                                                                                                                                                                                                                                                       283
                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AKAAGATEAATATLTPLPKATPAELSPYYEOKLGWRDCGVPGFOCATMKAPLDYAKPA
DGDVRLAVARKAATGPCKRLGSLLVNPGGPGGSALGYLOQYAGLGYPAKVRAOYDMVA
VDPRCVYARSEPEVECLOGREMDAYTETDVTPDDAGETDBLVDAYKEFABECGADARKLL
RHVSTVEAARDMDVLRAVLGDEKLTYVGASYGTFLGATYAGLFPDRTGRLVLDGAMDP
SLPARRLAVLEQTEGFFTAFOS FAKDCVKOPDC PLGDKDTTPDOVGKNLKSFEDDLDAK
PLPARRLAVLEQTEGFFTAFOS FAKDCVKOPDC PLGDKDTTPDOVGKNLKSFEDDLDAK
PLPARRLAVLEQTEGFFTAFOS FAKDCVKOPDC PLGDKDTTPDOVGKNLKSFEDDLDAK
PLPARLAVLEGTEGFFTAFOS FAKDCVKOPDC PLGDKDTTPDOVGKNLKSFEDDLDAK
PLPARLAVLEGTEGFFTAFOS FAKDCVKOPDC PLGDKDTTPDOVGKNLKSFEDSLDAK
PLPAGDADGRKLTESLATGVI AAMTUDGGAMOOLRESLTSATKEKDGAGLILLGSDY
EREADGGYSNLMFANAAVNCLDLPAAFSSPDEVRDALPDFEKASPVFGEGLAWSSLNC
                                                                                                                                                                                                                                                                                                                                                                                         /function="active 1734...1764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AYWPVKPTGEPHRIEAAGATPIVVVGTTRDPATPYRWAEALSDQLTSGHLLTYEGDGH
TAYGRGSSCIDSAINTYLLTGTAPEDGKRCS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="slpD"
104. .1723
                                                                                                                                                                                                                                                                                                                                                     /note="putative"
715 c 601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /evidence=experimental
/product="proteinase"
/protein_id="AAA93056.1"
/db_xref="GI:940303"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /label=misc_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="putative"
/function="codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="slpD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         translation="MDTRRTHRRTRTGGTRFRATLLTAALLATACSAGGASTSAGSPA/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
/function="hydrolysis of proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="slpD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref-"taxon:1916"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /strain="66"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="slpD"
/note="codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /standard_name="membrane lipoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /clone="p5-6"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .1820
                                                                                                                                                                                                                                                     17.0%;
52.5%;
                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                               Score 265.2; DB 73; Pred. No. 6.5e-28; D; Mismatches 678;
                                                                                                                                                                                                                                                                                                                                                                                                            for serine; by homology; tive site serine"
                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66) (clone:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cysteine'
                                                                                                                                                                                                                                                                                                                                                       221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   lividans"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Actinobacteridae;
antomvcetaceae; Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         p5-6)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         and
                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                        Length 1820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      attachment
                                                                                                                                                                                                                                                                                                                                                                                                                                putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       peptides'
                                                                                                                                                                                                                                   36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   66
                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      residue"
410
                                                                                                               196
                                    256
                                                                           350
                                                                                                                                                                                                                                   8;
```

Qγ

밁

Š

рь

δÃ

24 24 25 25

Вр

```
1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          491
                                                                                     ggcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaacgt
                                                                                                                                                              CCCCGGACGAGGTGCGCCCTCCCCGACTTCGAGAAGGCGTCCCCGGTCTTCGGCG
                                                                                                                                                                                            cagcggcctgggtggccgccgaccaacggatccgtcaggtcgcccgttccttagctacg
                                                                                                                                                                                                                                                                                                                      gcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatc
                                                                                                                                                                                                                                                                                                                                                                                                            ccggcgacttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tcaaccgctaccacgccctggttgacccgctggtgcagaagccggggtaagacgtcggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         actgcgcccgctcgccgtct-----gggcaccgactcggcccagtggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagccgttagcccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgacgccgcaccccgcggccggccgggctggcaaggtcgtcgtggtgtccaccaccc
                                                                                                                                                                                                                                                                          GCAACCTGATGTTCGCCAACGCCGCCGTGAACTGCCTCGACCTCCCCGCCGCCTTCTCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccctcagcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcagcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCAAGAACCTCAAGTCCTTCTTCGACGACCTGGACGCGAAGCCCCTGCCCGGCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgagaggggtcggccactcgaccctgcgttgcggtgtcgccaccgacgccgagttcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tggcacccgcgatcgccgacacccgacattctcgacccttcgacctggtgggcttcgacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gagcactgctggtcaatcctggggggacccgggggggtcggcggtcgacatggtcgccgcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACGAGGGCGCCTGGCAGCTGCGCGAGTCCCTCACCTCGGCGATCAAGGAGAAGGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCGACGCCGCAAGCTCACCGAATCCCTCGCCACCACCGCGTGATCGCCGCGATGTACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACTGCGTGAAGCAGCCGGACTGCCCCCTCGGCGACAAGGACACCACCCCCGACCAGGTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCCGCCTGAACCTGGAGCAGACGGAGGGCTTCGAGACGGCGTTCCAGTCCTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCTCCACGGTCGAGGCGGCACGCGACATGGACGTCCTGCGCGCGGTGCTGGGGCGACGAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCTACAAGGAGTTCGCCGAGGGCTGCG--GGGCGGACGCGCCGAAGCTGCTGCGCC-ACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCCGGGGCGTGGCCCGCAGTGAACCCG---TCGAGTGCCTGGACGGGCGCGAGATGGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACGCGGGCATCGGCTACCCGGCGAAGGTCCGCGCCCAGTACGACATGGTGGCGGTCGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCTCGCTGCTGGTCAACCCGGGCGGACCGGGCGGCTCGGCGATCGGCTACCTCCAGCAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggacacaagcgaagttggcggtgatccgc-----gtccccgcgaccgggacagcgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AGCTGACCTACGTGGGAGCGTCGTACGGCACCTTCCTGGGCGGCGACCTACGCCGGTCTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACGGCGACGTCCGGCTCGCGGTGGCCCGCAAGAAGGCCACGGGGCCGGGCAAGCGCCTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1184
                                                                                                                                                                1424
                                                                                                                                                                                                                                                                                                                                                                                   1304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     707
```

04 04 04 04 05 06 06 08

```
KEYWORDS
SOURCE
ORGANISM
                                                                                                 В
                                                                                                                           Q
                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
I38962
              δÃ
                                            밁
                                                                  δ
                                                                                                                                                        DЪ
                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                             멍
                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                         BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1599
                                                                                                   471
                                                                                                                                                           411
                                                                                                                                                                                      257
                                                                                                                                                                                                                  351
                                                                                                                                                                                                                                            197
                                                                                                                                                                                                                                                                       291
                                                                                                                                                                                                                                                                                                   137
                                                                                                                                                                                                                                                                                                                               231
                                                                                                                                                                                                                                                                                                                                                                                     hes 788;
cgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacg
                                                                                                                                                                                                                                                                                          cggtcgtggcgccaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
                                                                                                                                                                                                                                                                                                                               CCGCGGCCAAGGCGGCGGCGGCGACGGAGGCGGCCACGGCGACCCTGACCCCCCTGCCGA
                                                                                                                                                                                                                                                                                                                                          çg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              actctgcggtgatgcactattttctcgacgggaccttgccgccgacgagtctgcggtgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACGCGGGCATCGGCTACCCGGCGAAGGTCCGCCCCAGTACGACATGGTGGCGGTCGACC
                                                          tggcacccgcgatcgccgacaccgacattctccgccaccttcgacctggtgggcttcgacc
                                                                                                                 gagcactgctggtcaatcctgggggacccgggggcgtcggcggtcgacatggtcgccgcta
                                                                                                                                                           ACGGCGACGTCCGGCTCGCGGTGGCCCGCAAGAAGGCCACGGGGCCGGGCCAAGCGCCTCG
                                                                                                                                                                          ggacacaagcgaagttggcggtgatccgc----gtccccgcgacgggacagcgattcg
                                                                                                                                                                                                                                aaattcgcactgcacgctgcgcgacggtgtccgtccccgtcgactacgaccaacccggtg
                                                                                                                                                                                                                                                                          AGGCCACGCCGCCGAGCTGTCCCCCGTACTACGAGCAGAAGCTCGGCTGGCGCGACTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   င္ပ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACTCCGCGATCAACACGTACCTGCTGACCGGCACCGCCCCGGAGGACGGCAAGCGCTGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCTCCTCACCTACGAGGGAGACGGCCACACCGCGTACGGCCGCCGGCAGCTCCTGCATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgctgatcaccttcgacggcacccaacactgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGGAGCCGCATCGAGGCGGCCGGCCGCGCCATCGTCGTCGTCGGCACCACCC
                                                                                                                                                                                                                  GCGTCCCGGGCTTCCAGTGCGCCACCATGAAGGCCCCGCTCGACTACGCCAAGCCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 (bases 1 to 1820)
Hadary,D., Bartfeld,D., Butler,M.J., Jenish,D., Malek,L.T., Soostmeyer,G. and Walcyzk,E.
Streptomyces proteases and improved streptomyces expression of peptides and polypeptides expression of peptides and polypeptides Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 7 from patent I38962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unknown.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      138962.1
                                                                                                                                                                                                                                                                                                                                                                                   h 17.0%;
Similarity 52.5%;
88; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Unclassified.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="unknown"
715 c 601 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .1820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              dq
                                                                                                                                                                                                                                                                                                                                                                                   Score 265.2; DB 81;
Pred. No. 6.5e-28;
0; Mismatches 678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5616485.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      221
                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          strains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                13-MAY-1997
                                                                                                                                                                                      310
                                                                                                                                                                                                                  410
                                                                                                                                                                                                                                                                        350
                                                                                                                                                                                                                                                                                                    196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1538
                                                                                                                                                                                                                                                                                                                                                                                     8
```

```
1659
                                                                                                                                                                                                           1479
                                                                                                                                                                                                                                                                            1425
                                                                                                                                                                                                                                                                                                                                                                                 1196
                                                                                                                                                                                                                                                                                                                                                                                                                   1305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 591
                actctgcggtgatgcactattttctcgacgggaccttgccgccgacgagtctgcggtgcg
                                                                  gctgatcaccttcgacggcaccacacacactgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                                                         acgacccggccactccgtatcagtccggggtagacctggcccgccagct---gggcgcac
                                                                                                                                                                                                                                                                                                                                                                                                              gcaacgaccaggacgcgttcaacgcggtccggttgcgtctatgcgcccacaccggccgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   actgcgcccgctcgccggcctgccctct-----gggcaccgactcggcccagtggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagccggttagcccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                                            cgacgccgcaccccgcggcggccgggccgggctggcaaggtcgtcgtggtgtccaccaccc
                                                                                                                                                                                                                                                                                              ggcagttcaccggatccgcccccgcgatctgtgcgcctgtggcccggtgccggcaacgt
                                                                                                                                                                                                                                                                                                                                                                   cacgtggc----ctgagctacgccgacgcgacgacgggcaccatcaacgcgctgtaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tcaaccgctaccacgccctggttgacccgctggtgcagaagccggggtaagacgtcgggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACTCCGCGATCAACACGTACCTGCTGACCGGCACCGCCCGGAGGACGGCAAGCGCTGCT
                                                                                                                                     GCGACCCGGCCACCCCTACCGCTGGGCCCGAGGCCCTCTCCGACCAGCTCACCTCCGGCC
                                                                                                                                                                                                         GGGAGCCGCACCGCATCGAGGCGGCCGGCGCCCCCCCGATCGTCGTGGTCGGCACCACCC
                                                                                                                                                                                                                                                                          AGGGCCTCGCCTGGTCCTCCTGAAC----TGCGCGTACTGGCCGGTGAAGCCCACGG
                                                                                                                                                                                                                                                                                                                                               CCCCGGACGAGGTGCGCGACGCCCTCCCCGACTTCGAGAAGGCGTCCCCGGTCTTCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCGACGCCGCAAGCTCACCGAATCCCTCGCCACCACCGCGTGATCGCCGCGATGTACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCAAGAACCTCAAGTCCTTCGTCGACGACCTGGACGCGAAGCCCCTGCCCGGCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACTGCGTGAAGCAGCCGGACTGCCCCCTCGGCGACAAGGACACCACCCCCGACCAGGTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GCCGCCTGAACCTGGAGCAGACGGAGGGCTTCGAGACGGCGTTCCAGTCCTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AGCTGACCTACGTGGGAGCGTCGTACGGCACCTTCCTGGGCGCGACCTACGCCGGTCTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TCTCCACGGTCGAGGCGGCACGCGACATGGACGTCCTGCGCGCGGTGCTGGGCGACGAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCTACAAGGAGTTCGCCGAGGGCTGCG--GGGCGGACGCGCCGAAGCTGCTGCGCC-ACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCCGGGGCGTGGCCCGCAGTGAACCCCG---TCGAGTGCCTGGACGGGCGCGAGATGGACG
                                1552
                                                                                                                                                                                                                                                                                                           1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1015
                                                                                                                                                                                                                                                                          1478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1004
                                                                    1658
                                                                                                                                       1598
                                                                                                                                                                                                         1538
                                                                                                                                                                                                                                          1375
                                                                                                                                                                                                                                                                                                                                                                               1255
                                                                                                                                                                                                                                                                                                                                                                                                                  1364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            944
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 647
```

Ş

B

δõ

В

γQ

δã

Qy

рь оу оу оу оу оу

밁

Š

Dy Qy δÃ

밁

δÃ

밁

Дb

QΥ

δĀ

В

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LOCUS
DEFINITION
                 δÃ
                                           Ъ
                                                          Qy
                                                                                  р
                                                                                                     Ωy
                                                                                                                                Ъ
                                                                                                                                                Ωy
                                                                                                                                                                        ду
Фу
                                                                                                                                                                                                                                     QУ
                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
AR027260
  Д
                                                                                                                                                                                                                     рЬ
                                                                                                                                                                                                                                                                                                             DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
Matches 788; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1553
                                                                                       648
                                                                                                           491
                                                                                                                                 591
                                                                                                                                                      431
                                                                                                                                                                             531
                                                                                                                                                                                                                        471
                                                                                                                                                                                                                                                                                                              351
                                                                                                                                                                                                                                                                                                                                   197
                                                                                                                                                                                                                                                                                                                                                         291
  765
                                                                                                                                                                                                                                                                                       257
                                                                                                                                                                                                                                                                                                                                                                                                    231 CCGCGGCCAAGGCGGCGGCGCGACGGAGGCGGCCACGGCGACCCTGACCCCCTGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                          77
             tcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                       tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
                                                                                                 cytaccygcycyatccyatgyccyactacaytccygcycgtcacccacytcyaacayy
                                                                                                                                                                           aaattcgcactgcacgctgcgcgacggtgtccgtcccgtcgactacgaccaacccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                6 <del>-</del> 6
cgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacc
                                                                                                                                                                                                                                                                             ggacacaagcgaagttggcggtgatccgc----gtccccgcgacgggacagcgattcg
                                                                                                                                                                                                                                                                                                                                                                     cggtcgtggcgcgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg
                                                                                                                                 CCCGGGGCGTGGCCCGCAGTGAACCCG---TCGAGTGCCTGGACGGGGGGGGAGATGGACG
                                                                                                                                                                                                                     GCTCGCTGCTGGTCAACCCGGGCGGACCGGGCGGCCTCGGCGATCGGCTACCTCCAGCAGT
                                                                                                                                                                                                                                                                 ACGGCGACGTCCGGCTCGCGGTGGCCCGCAAGAAGGCCCACGGGGCCGGGCCAAGCGCCTCG
                                                                                                                                                                                                                                                                                                             GCGTCCCGGGCTTCCAGTGCGCCACCATGAAGGCCCCGCTCGACTACGCCAAGCCCGCCG
                                                                                                                                                                                                                                                                                                                                                         AGGCCACGCCGCGAGCTGTCCCCGTACTACGAGCAGAAGCTCGGCTGGCGCGACTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AR027260
Sequence
AR027260
AR027260.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 (bases 1 to 1821)
Bartfeld,D., Butler,M.J., Hadary,D., Jenish,D.L., Krieger,T.J.,
Malek,L.T., Soostmeyer,G., Walczyk,E., Krygsman,P. and Garven,S.
Streptomyces proteases and methods for improved secretion of
recombinantly-expressed proteins
Patent: US 5856166-A 7 05-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unclassified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  283
                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="unknown"
715 c 602 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
1. .1821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1821
                                                                                                                                                                                                                                                                                                                                                                                                                                                         17.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              patent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dq
                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 265.2; DB 81;
Pred. No. 6.5e-28;
0; Mismatches 678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA
US 5856166.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                              36;
                                           ACG
                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
 824
                                                          610
                                                                                                                                                                                                                                                                                                                                                                                                     290
                     670
                                                                                     707
                                                                                                                                 647
                                                                                                                                                     490
                                                                                                                                                                        590
                                                                                                                                                                                                  430
                                                                                                                                                                                                                                                                                                             410
                                                                                                                                                                                                                                                                                                                                   256
                                                                                                                                                                                                                                                                                                                                                                               196
                                           764
                                                                                                           550
                                                                                                                                                                                                                                                                  470
                                                                                                                                                                                                                                                                                                                                                         350
                                                                                                                                                                                                                                                                                                                                                                                                                                                00
```

```
DEFINITION
ACCESSION
VERSION
KEYWORDS
                                                                                                                                                                                                 Ş
                                                                                                    RESULT
SCH5/c
                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                             БР
                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멅
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                    LOCUS
                                                                                                                                                                    1719
                                                                                                                                                                                                                                                                                                                                                                                                                                    1479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          731
                                                                                                                                                                                                 cg
                                                                                                                                                                  6
                                                                                                                                                                                                                                                    actctgcggtgatgcactattttctcgacgggaccttgccgccgacgagtctgcggtgcg
                                                                                                                                                                                                                                                                                                                   cyctyatcaccttcgacygcacccaacactgcgytyttcgatgycaaccagtytytyg
                                                                                                                                                                                                                                                                                                                                                                                   acgacccggccactccgtatcagtccggggtagacctggcccgccagct---gggcgcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gcaacgaccaggacgcgttcaacgcggtccggtcggtctatgcgcccacaccggccgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ccggcgacttgctggtgcttgccgacgactatgacggccgggatgcagacgggcactaca
                                                                                                                                                                                                                                                                                                ACCTCCTCACCTACGAGGGAGACGGCCACACCGCGTACGGCCGCGGCAGCTCCTGCATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                   GGGAGCCGCACCGCATCGAGGCGGCCGCCGCCCCCGATCGTCGTCGTCGGCACCACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                cgacgccgcaccccgcggccggccgggccgggcctggcaaggtcgtcgtcgtggtgtccaccaccc 1375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CCCCGGACGAGGTGCGCGACGCCCTCCCCGACTTCGAGAAGGCGTCCCCGGTCTTCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTGCGGGCCTGCTGATCCTCCCGACAGCTACTACGAGCCGAGGCCGACGGCGGCTACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GCAAGAACCTCAAGTCCTTCTTCGACGACCTGGACGCGAAGCCCCTGCCCGGCGGCGACG
                                                                                                                                                                                                                                                                                                                                                                  GCGACCCGGCCACCCCTACCGCTGGGCCGAGGCCCTCTCCGACCAGCTCACCTCCGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGGGCCTCGCCTGGTCCTCCCTGAAC----TGCGCGTACTGGCCGGTGAAGCCCACGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaacgt 1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cagcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCAACCTGATGTTCGCCAACGCCGCCGTGAACTGCCTCGACCTCCCCGGCCGCCTTCTCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccctcagcgctggaagtacctgaccagtggtctgctggggctgcagcgcggcagcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tcaaccgctaccacgccctggttgacccgctggtgcagaagccggggtaagacgtcggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             actgcgcccgctcgccggcctgccctct-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCCGCCTGAACCTGGAGCAGACGGAGGGCTTCGAGACGGCGTTCCAGTCCTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagccgttagcccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                                                   ACTCCGCGATCAACACGTACCTGCTGACCGGCACCGCCCCGGAGGACGGCAAGCGCTGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGACGGCCGCAAGCTCACCGAATCCCTCGCCACCACCGGCGTGATCGCCGCGATGTACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACTGCGTGAAGCAGCCGGACTGCCCCCTCGGCGACAAGGACACCACCCCCCGACCAGGTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SCH5 4
Streptomyces
acetyl-coenzyme A synthetase; acsA; anti-sigma factor; ATP-b;
protein; bldG, anti-sigma factor antagonist; DNA polymerase;
                                   AL035636.1 GI:4539555
                                                                                                                                                                                                   1554
                                                                                 40544 bp
                                                                   coelicolor
                                                                   cosmid
                                                                   H5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -gggcaccgactcggcccagtggg
|| || || | | | | ||
                factor; ATP-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1184
                                                                                                                                                                                                                                 1718
                                                                                                                                                                                                                                                                                                  1658
                                                                                                                                                                                                                                                                                                                               1492
                                                                                                                                                                                                                                                                                                                                                                  1598
                                                                                                                                                                                                                                                                                                                                                                                                 1432
                                                                                                                                                                                                                                                                                                                                                                                                                                 1538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           901
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The more significant matches with motifs in the PROSITE database are also included but some of these may be fortuitous. The length in codons is given for each CDS.

Usually the highest scoring match found by fasta -o is given for CDS which show significant similarity to other CDS in the database. The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon. Gene prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IMPORTANT: This sequence MAY NOT be the entire insert of the sequenced clone. It may be shorter because we only sequence overlapping sections once, or longer, because we arrange for small overlap between neighbouring submissions. Cosmid H5 like between E2 and H17 on the AseI-H genomic restriction fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (08-MAR-1999) Streptomyces coelicolor sequencing projestanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. David A. Hopwood, [3] John Innes Centre, Norwich Research Park,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most process of the codon o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (URL; http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are numbered using the following system eg SC7B7.01c. SC (S. coelicolor), 7B7 (cosmid name), .01 (first CDS), c (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Seeger, K.J. and Unpublished 3 (bases 1 to 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A set of ordered cosmids and a detailed for the 8 Mb Streptomyces coelicolor A3(Mol. Microbiol. 21 (1), 77-96 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Streptomyces coelicolor A3(2).
Streptomyces coelicolor A3(2)
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Lipoprotein; oxidoreductase; proteinase; pyrophosphate synthase; secretory protein; septum site determining protein; serine protease; slpD; sodium/proton antiporter; transferase; transposa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Details of S. coelicolor sequence available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       upstream initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              http://www.nih.go.jp/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         by the BBSRC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Streptomyces coelicolor sequencing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Notes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Colney, Norwich, Norfolk NR4 7UH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bentley, S.D., Parkhill, J., Barrell, B.G. and Rajandream, M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97000351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Kinashi, H. and Hopwood, D.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 (bases 1 to 40544)
Redenbach, M., Kieser, H.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tRNA Thr anticodon CGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              topoisomerase I; helicase; hydrolase; integral membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Actinomycetales; Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (bases 1 to 40544)
/gene="SCH5.01"
/note="SCH5.01, partial CDS, possible transposase, l
/note="SCH5.01, partial CDS, possible transposase, l
>228aa; similar to many eg. TR:Q54404 (EMBL:Z]1519)
probable transposase from Tn4811 of Streptomyces liv
66 (320 aa) fasta scores; opt: 535, z-score: 648.0,
                                                                                                                                                                                                                                           /gene="SCH5.01"
<1. .691
                                                                                                                                                                                                                                                                                                                                       1. .691
                                                                                                                                                                                                                                                                                                                                                                            /clone="cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="taxon:100226"
                                                                                                                                                                                                                                                                                                                                                                                                                                                               /strain="A3(2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  to 40544)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  coelicolor sequencing at the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Denapaite, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             coelicolor A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              at The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                red genetic and
A3(2) chromoson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eichner, A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sanger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sanger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Centre is funded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fragment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cullum, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            lies
                                                                lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       project,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          most
```

```
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="SCH5.02c, slpD, proteinase, len: 539aa; identical to the previously sequenced TR:054398 (BMB::L42758) slpD, mycelium-associated (lipoprotein) proteinase from Streptomyces lividans 66 (539 aa) fasta scores; opt: 3608, z-score: 3750.3, E(): 0, (100.0% identity in 539 aa overlap). Also similar to two other peptidases from Streptomyces coelicolor SC9C7.15c (EMBL:AL035161) fasta scores; opt: 666, z-score: 603.6, E(): 9.4e-29, (35.7% identity in 502 aa overlap) and SCHB5.03c (EMBL:AL03517) fasta scores; opt: 661, z-score: 598.9, E(): 1.7e-28, (32.6% identity in 562 aa overlap). Contains probable N-terminal signal sequence. Also contains Pfam match to entry PF00561 abhydrolase, alpha/beta hydrolase fold, score 56.80, E-value 4.7e-13.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement (1145. .2257)
/gene="SCH5.02c"
/note="Pfam match to entry PF00561 abhydrolase,
/note="Pfam match to entry PF00561 abhydrolase,
                                                                                                                                            /note="SCH5.03c, possible DNA polymerase, len: 401aa; limited region of similarity to many DNA polymerase III subunits ge. SW:DP3X_SALTY DNA polymerase III subunits gamma and tau from Salmonella typhimurium (642 aa) fasta scores; opt: 327, z-score: 338.5, E(): 1.5e-11, (32.1% identity in 246 aa overlap). Contains probable coiled-coil from 245 to 285 (41 residues), max score: 1.601,
                                                                                                                                                                                                                                                                                                                                                                             complement(2835. .4040)
/gene="SCH5.03c"
                                                                                                                                                                                                                                                                                                                                                                                                                                           hydrolase fold, score 5 complement(2835, 4040)/gene="SCH5.03c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VDPRGVARS EPVECLDGREMDAYTRTDVTPDDAGETDELVDAYKEFAEGCGADAPKLL
RIVSTVEAARDMDVLKAVLGJEKLTYVGASYGTFLAGTYAGLEPDRTGRLVLDGAMDP
SLPARRLANLEQTEGFETAFQSFAKDCVKQPDCPLGDKNTTPDQVGKNLKSFEDDLDAK
PLPAGDADGRKLTESLATTGV LAAMVDEGAWQQLRESLTSAIKEKDGAGLLILSDSYY
EREADGGYSNLMFANAAVNCLDLPAAFSSPDEVRDALLDFEKASPVFGEGLAWSSINC
AYMPVKPTGEPHRIEAAGATTIVVVGTTRDPATPYRWAEALSDQLTSGHLLTYEGDGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(1103.
/gene="SCH5.02c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(1103.
/gene="SCH5.02c"
/note="slpD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="ILYLNRTGIPWKYLPHDFPGHGTVYFYYAAWRDEGIFTQLNYDL
TALARVKEGRKPEPTASVIDTQSVKTSTNVPLTSQGTDAAKKIVGRKKGILTDTIGLI
LAVTVTGAGLSENAVGIRLLDQAKRTYPTIVKSWVDTGFKNAVIEHGATLGIDVEVVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAYGRGSSCIDSAINTYLLTGTAPEDGKRCS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AKAAGATEAATATLTPLPKATPAELSPYYEQKLGWRDCGVPGFQCATMKAPLDYAKPA
DGDYRLAVARKKATGPGKRLGSLLVNPGGPGGSAIGYLQQYAGIGYPAKVRAQYDMVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product-"proteinase"
/protein_id="CAB38476.1"
/db_xref="GI:4339557"
/translation="MDTRRTHRRTRTGGTRFRATLLTAALLATACSAGGASTSAGSPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="putative transposase"
/protein_id="CAB38475.1"
/db_xref="GI:4539556"
                          transl_table=11
/label=SCH5.03c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(918. .994)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8.7e-29, (41.0% identity in 227
/product="putative DNA polymerase"
                                                                                                                        (probability 0.99)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           note="tRNA Thr anticodon CGT, Cove score 80.05"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DETTPTWRGTY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  {	t RNPEKRGFHVVKRRWVVERSIGWIMMHRRLARDYETLTTSSEAMIHIASIDNLAKRIT}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Nominal overlap with Streptomyces coelicolor cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="SCH5.01"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label=SCH5.01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     overlap)"
                                8
                                                                                        δÃ
                                                                                                                                                      В
                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                2355
```

CDS

CDS

370

GCTCGCTGCTGGTCAACCCGGGCGGACCGGGCGGCTCGGCGATCGGCTACCTCCAGCAGT 2296

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                 2475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                               197
                                                                                                                                                                                                                                                                   137
                                                                                                                                                                                                                                                                                                                                                                 cagogococogitggooggogogacigaagaacooggogooggooaaacocoogggigogo 136
                                                                                 GCGTCCCGGGCTTCCAGTGCGCCACCATGAAGGCCCCGCTCGACTACGCCAAGCCCGCCG
                                                                                                                                                                                                                                                cggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacaccagcg 196
ggacacaagcgaagttggcggtgatccgc----gtccccgcgacagggacagcgattcg
                                                                                                                                   aaattcgcactgcacgctgcgacggtgtccgtcccgtcgactacgaccaacccggtg
                                                                                                                                                                                                        AGGCCACGCCGCGAGCTGTCCCCCGTACTACGAGCAGAAGCTCGGCTGGCGCGACTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                  788;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N-terminal 480a (approx.) contains several probable membrane spanning hydrophobic regions. 510-710aa similar to several thymidylate kinases eg. SW:KTHY_ECOLI thymidylate kinases eg. SW:KTHY_ECOLI thymidylate kinase, tmk, from Escherichia coli (213 aa) fasta scores; opt: 423, z-score: 339.7 E(): 1.3e-11, (38.4% identity in 198 aa overlap). 710-800aa (approx.) glutamic acid-rich region which may form a hinge structure. 800-1089aa has no distinguishing features or significant database similarities. Further clues to function may be indicated by the presence of matches to PS00217 Sugar transport proteins signature 2 and PS00017 ATP/GTP-binding site motif A (P-loop). Contains probable coiled-coil from 711 to 875 (165 residues), max score: 2.135, (probability 1.00)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement (4193 .7462)
/gene="SCH5.05c" with
/note="SCH5.05c, probable integral membrane protein with
/note="SCH5.05c, probable integral membrane protein. The
kinase activity, len: 1089aa; a multidomain protein. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(4193, .7462)
/gene="SCH5.05c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VVAMGAE IRAQDMRDTVRKSFTSPANGRWQI I LVEEAERLNEKSANAVLKAVEEPAPR
TVWLLCAPSVEDVLPT I RSRCRHLNLRTPSVEAVADMLVRREG I EPDVAAAAARATQG
HIDRARRLATDKAARDRRAAVLKLPLRVEDVGGALRAAQELVDAAAEDAKQLAEEMDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="mtvwddlvgqekvceplaaaardadafvtaaatagplpqstsmt
Hawlftgppgsgvartarafaaalqcvspdralggvpgcgfcdgchtalvgthadvst
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="integral membrane protein with kinase activity"
/protein_id="CAB38479.1"
/db_xref="GI:4539560"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="small hypothetical protein"
/protein_id="CAB38478.1"
/brotein_id="CAB38478.1"
/db_xref="gi:14539559"
/translation="mSVPPPRTMEGAPRISAAARCHGSVSRLGVTALCEGSV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="SCH5.04c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(4060.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="SCH5.04c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VLALQLGSRVATANADAEDALERLARGSTPESTLRRTEAVAACGEALDRNVPPLLAVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /label=SCH5.05c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /label=SCH5.04c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="SCH5.04c, unknown,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  {\tt KETEELKAALGAAQGGRLPRGTAGVIKDLEADQKRRKARTQRNSLDLALSELTGFYRD}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /protein_id="CAB38477.1"
/db_xref="GI:4539558"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17.0%;
52.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 265.2;
Pred. No. 1.5e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .4173)
                                                                                                                                                                                                                                                                                                                                                                                                                                         1.5e-28;
nes 678;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       len: 37aa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                               36; Gaps
                     310
                                                                                 2416
                                                                                                                                                                                                        2476
                                                                                                                                            256
                                                                                                                                                                                                                                                                                                                                                                                                                                               8;
```

```
1433
                                                                                                                                                                                                                                                                                                                                                                                                                        1521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgttaggtgacgatc
                                                                        acgacccggccactccgtatcagtccggggtagacctggcccgccagct---gggcgcac
                                                                                                                                                                   cyacgccgcacccgcggcgccggccgggggctggcaaggtcgtcgtcgtgtgtccaccaccc
                                                                                                                                                                                                                                                         ggcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaacgt
                                                                                                                                                                                                                                                                                                                                                       cageggectgggtggeegeegaceaaeggateegteaggtegeeeegtteettagetaeg
                                                                                                                                                                                                                                                                                                                                                                                                                   GCAACCTGATGTTCGCCAACGCCGCCGTGAACTGCCTCGACCTCCCCGCCGCCTTCTCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                gcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacaccggccgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccggcgacttgctggtgcttgccgacgactatgacggccggggatgcagacgggcactaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gccctcagcgctggaagtacctgaccagtggtctgctgggggctgcagcggcgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             actgcgcccgctcgccggcctgccctct-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tctaccggcagttggcccaggactgtgttgaccggatgggcttcagcttcttggccaata
                                                GCGACCCGGCCACCCCTACCGCTGGGCCGAGGCCCTCTCCGACCAGCTCACCTCCGGCC
                                                                                                                                        GGGAGCCGCACCGCATCGAGGCGGCCGGCCACCCCGATCGTCGTCGGCACCACCCC
                                                                                                                                                                                                                                 AGGGCCTCGCCTGGTCCTCCCTGAAC----TGCGCGTACTGGCCGGTGAAGCCCCACGG
                                                                                                                                                                                                                                                                                                                            CCCCGGACGAGGTGCGCGACGCCCTCCCCGACTTCGAGAAGGCGTCCCCGGTCTTCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GTGCGGGCCTGCTGATCCTCCGACAGCTACTACGAGCGCGAGGCCGACGGCGGCTACA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GCAAGAACCTCAAGTCCTTCTTCGACGACCTGGACGCGAAGCCCCTGCCCGCCGGCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | tcggtactcatgtgcggggggatggtcctcgacggcggtatcgatccagccgttagcccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacg
cgctgatcaccttcgacggcacccaacacactgcggtgttcgatggcaaccagtgtgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CCGACGGCCGCAAGCTCACCGAATCCCTCGCCACCACCGGCGTGATCGCCGCGATGTACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACTGCGTGAAGCAGCCGGACTGCCCCCTCGGCGACAAGGACACCACCCCCGACCAGGTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCCGCCTGAACCTGGAGCAGACGGAGGGCTTCGAGACGGCGTTCCAGTCCTTCGCGAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatgactacgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           agatcaactacctcggatacagctacggcaccaagttgggcaccgcttacctggaacggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCTACAAGGAGTTCGCCGAGGGCTGCG--GGGCGGACGCCGAAGCTGCTGCGCC-ACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCCGGGGCGTGGCCCGCAGTGAACCCG---TCGAGTGCCTGGACGGGCGCGAGATGGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACGCGGGCATCGGCTACCCGGCGAAGGTCCGCCCCAGTACGACATGGTGGCGGTCGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tggcacccgcgatcgccgacactccgaccacttcgaccttggtgggcttcgacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGCTGACCTACGTGGGAGCGTCGTACGGCACCTTCCTGGGCGCGACCTACGCCGGTCTGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -gggcaccgactcggcccagtggg
                                                                                                                                                                                    1375
                                                                                                                                                                                                                                 1348
                                                                                                                                                                                                                                                                                                                                                                     1255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1015
                                                                                                                                        1288
                                                                                                                                                                                                                                                                                                                            1402
                                                                                                                                                                                                                                                                                                                                                                                                                     1462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1702
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1762
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1882
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2179
```

Ş

04 04 05 05 В

OY OY OY OY OY OY OY OY OY

В

В

Ş

sections

once,

or longer,

we

```
JOURNAL
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOURNAL
MEDLINE
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
SC23B6/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 _ cg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACTCCGCGATCAACACGTACCTGCTGACCGGCACCGCCCCGGAGGACGGCAAGCGCTGCT | 1.08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  actctgcggtgatgcactatttctcgacgggaccttgccgccgacgagtctgcggtgcg
                                                         jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most restriction codon).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (02-AUG-2000) Streptomyces coelicolor sequencing proj
Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge
CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof.
David A. Hopwood, [3] John Innes Centre, Norwich Research Park,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomyces coelicolor A3(2).
Streptomyces coelicolor A3(2)
Streptomyces coelicolor A3(2)
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Streptomycineae; Streptomyces
IMPORTANT: This sequence MAY NOT be the entire insert of the sequenced clone. It may be shorter because we only sequence
                                                                                                                                  http://www.nih.go.jp/
jun/cgi-bin/frameplot.pl. CAUTION:
correct initiation codon. Where po
                                                                                                                                                                                                                           Gene prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot
                                                                                                                                                                                                                                                                                             CDS which show significant similarity to other CDS in the database The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon.
                                                                                                                                                                                                                                                                                                                                                                The more significant matches with motifs in the PROSITE database are also included but some of these may be fortuitous. The length in codons is given for each CDS.

Usually the highest scoring match found by fasta o is given for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (URL; http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are numbered using the following system eg SC7B7.0lc.coelicolor), 7B7 (cosmid name), .0l (first CDS), c (compl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             by the BBSRC Details of S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Notes:
Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Kinashi,H. and Hopwood,D.A.
A set of ordered cosmids and a detailed genetic and physical map
for the 8 mb Streptomyces coelicolor A3(2) chromosome
mol. microbiol. 21 (1), 77-96 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SC23B6 3
Streptomyces
                                                                                                                                                                                                     Nucleic Acids Research, program of Bibb et al.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Colney, Norwich, Norfolk NR4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Cerdeno, A.M., Parkhill, J., Barrell, B.G. and Rajandream, M.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Seeger, K.J. and Harris, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 (bases 1 to 38366)
Redenbach, M., Kieser, H.M., Denapaite, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AL390968
                                             upstream initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               97000351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sulfurylase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein; integral membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATP-dependent DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AL390968.1 GI:9714464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (bases 1 to 38366)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         38366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and Beowulf Genomics coelicolor sequencing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       coelicolor sequencing at The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    38366)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    đđ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          helicase; DNA-binding
                                                                                                                                                                                                          Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; DNA-binding protein; glutare protein; peptidase; secreted
                                                                                                                                                                                                          30:157-66(1984) as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7UH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       вст
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Eichner, A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sanger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sanger
                                                                                                                                                                                                          implemented
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          glutaredoxin-like
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         03-AUG-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cullum, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cambridge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          is funded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             project,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1168
                                                                                                                                                                                                          at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŝ.
                                                                       most
```

```
FEATURES
                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           small overlap between neighbouring submissions. Cosmid 23B6 .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="2SC3B6.02"
/note="2SC3B6.02, possible sulfurylase, len: 392 aa;
/note="2SC3B6.02, possible sulfurylase, len: 392 aa;
/note="2SC3B6.02, possible sulfurylase, len: 395 aa;
/note="2SC3B6.02, possible sulfurylase, 391 aa; fasta scores: opt:
1433 z-score: 1624.0 E(): 0; 56.2% identity in 395 aa
overlap and to SW:MOBE_ECOLI (EMBL:M21151) Escherichia
coli molybdopterin biosynthesis MoeB protein, 249 aa;
blastp scores: Score = 526 (185.2 bits), Expect = 1.1e-50,
p = 1.1e-5, Identities = 106/249 (42%), Positives =
156/249 (62%). Contains Pfam match to entry PF00899
This_family, This family and PF00581 Rhodanese,
Rhodanese-like domain"
complement(2109. .3650)
/gene="25C3B6.03c"
/gene="25C3B6.03c, peptidase, len: 513 aa; identical to
/note="25C3B6.03c, peptidase, len: 517 aa; identical to
/note="25C3B6.03c, peptidase, len: 518 aa; fasta scores: 518E, 518 aa and highly similar to Streptomyces coelicolor
25C3B6.04c, 516 aa; fasta scores: opt: 1544 z-score:
1384.8 E(): 0; 50.2% identity in 526 aa overlap. Contains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
/product="putative sulfurylase"
/product="putative sulfurylase"
/protein_id="cac01308.1"
/db_xref="GI:9714466"
/translation="MSLPPLVEPAAELTVDEVRRYSRHLIIPDVGMDGOKRIKNAKVLAVARAGIGSPTLMYLAAAGVGTLGIIEFDEVDESNLQROVIHSQADIGRPKAESARDT
IQGINPLVDVJLHQERLEADMVMDIFSQYDLIVDGTDNRATRYLVNDACVLLNRPYVM
GSIYRRDGQASVFWSEHGPCYRCLYPEPPPPGMVPSCAEGGVLGVLCASIGSIQTNEA
                                                                                                                                                                                                                                               complement(2109. .3650)
/gene="2SC3B6.03c"
                                                                                                                                                                                                                                                                                                                                                                                                                             /note="Pfam match to entry PF00899 Thir_family, Thir
family, score 216.00, E-value 5.4e-61"
1726. .2010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IKLLQGIGEPLVGRLMIYDALEMTYRQVKVRKDPNCAVCGENPTVTELIDYEAFCGVV
SEEAQAAAADSTITPKQLKEWIDDGENIELIDVREPNEFEIVSIPGARLIPKNEFLMG
SALENLPQDKKIVLNCKTGVRSAEVLAVLKSAGFSDAVHVGGGVIGWVNQIEPEKPVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="2SC3B6.02"
859. .2037
                                                                                                                                                                                                                                                                                                                    /note="Pfam match to entry PF00581 Rhodanese,
Rhodanese-like domain, score 51.70, E-value 1.6e-11"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RTDHGGRADPWETMPGYWDEIVSRVGTGVSE" 850. .853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LHWVVLNIADGPGAHPDPRCLEAAGRLRNAGIRVLGHLDTAYGARSLGEQISDARRYL
DWYQVDGFLLAHCPSDRAALPEVRRTVTTLRAIRDDAHIVLGHGTHPCPGYAENADQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="hypothetical protein 2SC3B6.01"
/protein_id="CAC01307.1"
/db_xref="Gi:9714465"
/translation="MSYLTSTKAGVASTGVHTGLGVPGLAHPLLAPDEWAGLTCPGTP
                                                                                                                                                                                                                                                                                                                                                                                         /gene="2SC3B6.02"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VTFSGTWADYRWSQAAEWSADYPPERFCHFVHGLPRGHLEEALRIARWQGAATICFTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="2SC3B6.02"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="25C3B6.01, unknown, len: 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="2SC3B6.01"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="2SC3B6.01"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="taxon:100226"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /strain="A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           note="nominal overlap with Streptomyces coelicolor cosmid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
```

Matches 695; Best Local Similarity

Conservative

12.0%; 51.1%;

Score 187.4; Pred. No. 7.7

Mismatches 621; .7e-18; DB 73;

Indels

45;

Gaps,

9

Length 38366;

lipoprotein lipid

Query Match

misc_feature

complement(5282...5314)
/gene="2SC3B6.04c"
/note="PS00013 Prokaryotic membrane
attachment site"

hydrolase fold, score

/note="Pfam match to entry PF00561 abhydrolase, hydrolase fold, score 52.00, E-value 1.3e-11"

alpha/beta

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(3809. .5359)
/gene="25C3B6.04c, peptidase, len: 516 aa; highly similar /note="25C3B6.04c, peptidase, len: 516 aa; highly similar to TR.Q54399 (EMBIL:142759) Streptomyces lividans proteinase SlpE, 513 aa; fasta scores: opt: 1543 z-score: 1741.5 E(): 0; 50.2% identity in 526 aa overlap and to Streptomyces coelicolor putative peptidase 28C3B6.03c, 513 aa; fasta scores: opt: 1544 z-score: 1465.5 E(): 0; 50.2% identity in 526 aa overlap. Contains Pfam match to entry PF00561 abhydrolase, alpha/beta hydrolase fold and correctly situated match to prosite entry PS00013 Prokaryotic membrane lipoprotein lipid attachment site.
                                                                                                                                                                                 LDTYPOQDATPDDRAERTEFUNTEERNAACEKHSKKILPHVETUDAARDMDLMROVL
GDEKLHYFGISYGTELGGVYAHLFPRHYGRAVDDAVVDPTQTAEQGSLGQAKGFQLAL
DNFAEDCVSKVEDCPYGDTAEDVERTLARLLKOLDRKDIPGIFPROLTEFJATTGIAG
ALYSKDFWEYLTEGLEOAYDGDGRVLMVLSDALNGRNEDGEYSNITAANVAINCADDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(3588. .3620)
/gene="2SC3B6.03c"
/note="PS00013 Prokaryotic membrane lipoprotein lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QRALDDYLESTGQEPEQGSRKIAGLLERLDAEPLPTSSPGRELTQTLAFTGIVLPLYS
ESGWPALTSALKAAEEGDGSELLALADGYNERDPSGRYGTTTHSQRVISCLDDKQRPT
VEETKKLLPRPEKVSPVFGAFLGWDTAGWCHDWPVAGQHETAEVSAPGADPVLVVGNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    hydrolase fold and correctly situated match to Prosite entry PS00013 Prokaryotic membrane lipoprotein lipid attachment site. Also contains possible N-terminal region
complement(3851. .4951)
/gene="2SC3B6.04c"
                                                                                                            PRYDPAYVEDKLPEFRDASPLFGDYLAWSMLSCTDWPVAGAADHPDVHAPGAAPILVI
GNTGDPATPYEGAGRMVDALGKGVGVELIYKGQGHGAYDSKNRCVQDAVHGYLLDGKV
                                                                                                                                                                                                                                                                                                                                /translation="mpnpsrlraaaltataaalsallagcgggsqeddedlsgqkliw
kncpapseaegggaapsplpdgdewqcatmkapldwddpkgdtiglaliraeadgaad
rrigslyeneggpggsgyttlpaegdyaklrtrydlysedprgygrsdpyeclddkQ
                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
/product="putative peptidase"
/protein_id="CAC01310.1"
/db_xref="GI:9714468"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(3809.
/gene="2SC3B6.04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(3653. .3657)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             attachment site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(2151. .3230)
/gene="2SC3B6.03c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKVCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PSGVPEALASQTLDWARCEGTDDAPAPDGDWRCATLKAPLDWSDPDGETIDLALIRSR
ASGDDRIGSLLFNFGGPGASGVSTMPSYADTVSSLHERYDLVSWDPRGVAASEGVRCR
TDEALEAAESVDSTPDSPAEEQAYLKDAADFGRGCEKAAGKLMEHVSTTDTAROMDLW
RHVLGDERMHYFGISYGTELGGVYAHLFPEHVGRVILDAVVDPGADTMGHAENQARGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Also contains possible N-terminal region signal peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="Pfam match to entry PF00561 abhydrolase,
hydrolase fold, score 41.50, E-value 1.9e-08"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GDPATPYEGARRMADELGKDVGVVLTWQGEGHGAYGNGSDCVDSAVDAYL1.KGTVPKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 signal peptide sequence"
                                                                             PAAKTVCS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /protein_id="CAC01309.1"
/db_xref="GI:9714467"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pfam match to entry PF00561 abhydrolase, alpha/heta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="MARLVRWTALTAAAALLTAGCSGGSSDEDKDDGGRSSAGPSAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="peptidase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5.04c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               alpha/beta
```

gene

RBS

CDS

1341	gatetgtgcgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgccggcc	1282
1281 4088	cggatccgtcaggtcgccccgttccttagctacgggcagttcaccggatccgcccccgc	1222
1221 4145	gtcoggtgogtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaa 	1162 4204
1161 4205	gactatgacggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcg	1102 4264
1101 4265	agtggtctgctggggctgcagcggcggcagcgcggcgacttgctggtgcttgccgac	1042 4321
1041 4322	gacgcgacgacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgacc	982 4381
981 4382	gttgacccgctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgcc 	922 4441
921 4442	ccggcctgcctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctg	865 4501
864 4502	agccaaatggcgggatttcagaccgctttcaatgactacgccgcccgactgcgcccgctcg	805 4561
804 4562	cgggcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatc	745 4621
744 4622	ggatacagctacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtg	685 4681
684 4682	gtcgcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctc	625 4741
624 4742	gcccaggactgtgttgaccggatgggcttcagcttcttggccaatatcggtaccgcgtcc	565 4798
564 4799	ccgatggccgactacagtccggccggcgtcacccacgtcgaacaggtctaccggcagttg	505 4858
504 4859	cactcyacccttcgtttgcygttgtcgcaccgacgcgagttcgacgcgttaccggcgcgat	445 4915
444 4916	gccgacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggc	385 4975
384 4976	aatcctgggggacccggggcgtcggcggtcgacatggtcgccgctatggcacccgcgatc	325 5029
324 5030	geggtgateegegteeeegegaegggaeagegatteggageaetgetggte 	274 5089
273 5090	tgcgcgacggtgtccgtcccgtcgactacgaccaacccggtgggacacaagcgaagttg	214 5149

 D
 Q
 Y
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D
 D

	COMMENT	REFERENCE AUTHORS TITLE JOURNAL			AUTHORS TITLE	SOURCE ORGANISM REFERENCE	VERSION KEYWORDS	RESULT 8 SCDBA/C LOCUS DEFINITION ACCESSION	Oy 1513 : Db 3853 :	Qy 1453; Db 3913;	Qy 1402 db 3973 d	Qy 1342 d	Db 4087
f Génomics f Génomics r sequencing at the Sanger Centre are r sequencing at the Sanger Centre are r sequencing with motification of the following system eg SC7B7.01c. SC (s. d name), .01 (first CDS), c (complementar trhes with motifs in the PROSITE database ome of these may be fortuitous. given for each CDS. given	land belone campus, minacum, sends supplies in Innes Centre, Norwich Rese NR4 7UH, UK	.G. and Rajandream,M.A	2 (bases 1 to 41800) Seeger,K.J. and Harris,D.	s coelicolor A3(2) chromosome 77-96 (1996)	enbach,M., Kieser,H.M., Denapaite,D., Eichner, ashi,H. and Hopwood,D.A. et of ordered cosmids and a detailed genetic a	Streptomyces coelicolor A3(2). Streptomyces coelicolor A3(2) Streptomyces coelicolor A3(2) Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces. 1 (bases 1 to 41800)		SCD8A 41800 bp Streptomyces coelicol	ttotogacgggacottgcogocgacgagtotgcggtgcgc 1553 	acccaacactgcggtgttcgatggcaaccagtgtgtggactctgcggtgatgcactat 1512	ggggtagacotggccogccagctgggcgcaccgctgatcaccttcgacggc 1452 	ggggctggcaaggtcgtcgtggtgtccaccaccaccaccggccactccgtatcagtcc 1401 	TGCACGGACTGGCCGGTCGCCGGAGCCGCGACCACCGGGACGTCCACGCGCCG 4034

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RBS
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, 9tg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream initiation codon.

IMPORTANT: This sequence MAY NOT be the entire insert of the sequenced clone. It may be shorter because we only sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cosmid D8A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       overlapping sections once, or longer, because visuall overlap between neighbouring submissions.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        http://www.nih.go.jp/
                                                                                                                                                                                                                                                                           /note="SCDBA.02, possible sensor kinase protein, len: 426
aa; similar to SW:SEX3_MYCTU (EMBL:Y13628) Mycobacterium
tuberculosis sensor-like histidine kinase SenX3 (EC
2.7.3.-), 410 aa; fasta scores: opt: 874 z-score: 939.7
E(): 0: 43.6% identity in 406 aa overlap and to C-terminal
region of SW:PHOR ECOLI (EMBL:X04704) Escherichia coli
phosphate regulon sensor protein PhoR, 431 aa; fasta
scores: opt: 521 z-score: 562.5 E(): 6.7e-24; 36.8%
identity in 261 aa overlap; also similar to various S.
coelicolor sensor proteins, e.g. SCH22A.18c, 370 aa; fasta
scores: opt: 415 z-score: 388.1 E(): 3.9e-16; 31.1%
identity in 383 aa overlap. Contains Pfam match to entry
PF00512 signal, Histidine kinase and possible N-terminal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="SCD8A.01c"
/gene="SCD8A.01c", probable phosphate transport system
/note="SCD8A.01c, probable phosphate transport system
regulatory protein (fragment), len: >139 aa; similar to
C-terminal region of TR:053833 (EMBL:AL022004)
Mycobacterium tuberculosis phosphate transport system
regulatory protein, Phoy-2, 213 aa; fasta scores: opt: 383
z-score: 454.2 E(): 7.2e-18; 46.8% identity in 139 aa
overlap and of SW:PHOU_ECOLI (EMBL:X02723) Escherichia
coli phosphate transport system regulatory protein, PhoU,
241 aa; fasta scores: opt: 213 z-score: 258.9 E():
5.5e-07; 28.1% identity in 128 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Streptomyces c
/strain="A3/2)"
/db_xref="taxon:10026"
/clone="cosmid DBA"
complement(1...417)
/gene="SCDBA.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of Bibb et al., Gene 30:157-66(1984) as implemented
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="SCD8A.02"
632. .1912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="nominal overlap with S. coelicolor cosmid 2StD46" complement(<1, .417)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(1. .319)
/gene="SCD8A.01c"
                                 /translation="mDVNAAVAAVAAIAGVLTGVIAVLAFRWSEREQKRPTRTSLHTD
PVLPPGVDTVLSVLRSSAVVLDEADAVVKASSAAYALGLVRGGRLAVEPMLQMARDTR
                                                                                              /product="putative sensor kinase protein"
/protein_id="CAB77323.1"
/db_xref="GI:7242750"
                                                                                                                                                                                                                                                       region signal peptide sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(426. .431)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LARLRYPERAVPHDLHATILEMGQLAQRLMAKAAEVI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MRDAYHEELDSIGDGLVEMARLVGSAIGRATTAILDSDLKLAEA
VIEADQKVDNLQHELEARAITLLARQQPVATDLRIVVTSLRMSADLERSGDLAQHVAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein (fragment)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
/product="putative_phosphate_transport_system_regulatory
   RDGETRQVELDLPRRGNGRGEALAVSARVAPLGSRLVLLLVEDLTEARRTEAVRRDFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="SCD8A.02"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /protein_id="CAB77322.1"
/db_xref="GI:7242749"
                                                                                                                                                                                          transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     or longer, because we arrange for a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                coelicolor A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          at
                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                           RBS
                                                                                                                                                                                                                                                                                     misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                /gene="SCD8A.05"
4177. .4659
                           'gene="SCD8A.05"
'note="SCD8A.05,
```

```
/note="SCD8A.03, probable response regulator, len: 223 aa; similar to TR:086269 (EMBL.AJ001103) Lactococcus lactis ArcA protein, 233 aa; fasta scores: opt: 700 z-score: 810.0 E(): 0; 49.3% identity in 223 aa overlap and to TR:056180 (EMBL:U38917) Synechococcus sp. response regulator PhoB, 234 aa; fasta scores: opt: 687 z-score: 795.1 E(): 0; 48.0% identity in 229 aa overlap, and similar to many S. coelicolor response regulators, e.g. SCH22A.19c, 256 aa; fasta scores: opt: 687 z-score: 696.9 E(): 2.5e-33; 49.1% identity in 224 aa overlap. Contains Pfam matches to entries PF00072 response_reg, Response regulator receiver domain and PF00486 trans_reg_C, Transcriptional regulatory protein, C terminal"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="SCD8A.03"
2353. .2571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /notee "SCD8A.04c, possible lipoprotein, len: 241 aa
Contains correctly situated match to Prosite entry PS00013
Prokaryotic membrane lipoprotein lipid attachment site and
possible N-terminal region signal peptide sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="SCD8A.03"
/note="Pfam match to entry PF00486 trans_reg_C,
Transcriptional regulatory protein, C terminal, score
117.10, E-value 9.8e-34"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            regulator receiver 1918. .2589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="mLVVEDEESFSDALSYMLRKEGFEVAIATTGPDGLDEFERNGADLVLLDLMLPGLPGTEVCRQLRGRSNVPVIMVTAKDSEIDKVVGLEIGADDYVTKPFSSRLVARIRAVLRRRGEPEEVAPAALEAGPVRMDVDRHVVTVGGTKVDLPLKEFDLLEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QNDDPLDDAEPVRVDELVAEAIDRCRHAAGTKQITMAAGGTADLHVRGNRGQLAAALG
NLVENAVNYSPARTRVGIAARRVAAPGGDLIEIAVTDQGIGISEKDKERVFERFYRVD
                                                              /gene="SCD8A.04C"
/note="bcccccc"
                                                                                                                                                          GATGDTDETGTGTETGAGTEAGH"
                                                                                                                                                                                                              /translation="MSSSLRRGALAAAAIAFSIASLAACGAGHNAQTLEIKPDNAATS
VGDIKVQNAVVITQPDLESTGPAVVSATLFNSGDKDQTLESVTVAGTDKSAELKPAKG
EKGDLTVPAGGSLVLGGKDNAAAVLPSSREAVQDGNAQKITFFEFSKTGAVSLRAFVVVP
                                                                                                                                                                                                                                                                                                             /transl_table=11
/product "putative lipoprotein"
/protein_id="cas77325.1"
/db_xref="GI:7242752"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="SCD8A.04c"
/note="crrc-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
/product="putative response regulator"
/protein_id="CAB77324.1"
/db_xref="GI:7242751"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               kinase,
complement(3487.
                          attachment site"
                                                                                                                                                                                    AESFFAEWGPSETPAAPGASAQPSGEASAETSGEPADGEASGTPADGETAPGTDDATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Pfam match to entry PF00072 response_reg,
regulator receiver domain, score 130.30, E-value
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LLRNAGRVLTRMQLIDRVWGADYVGDTKTLDVHVKRLRAK1EPDPGAPRYLVTVRGLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="Pfam match
kinase, score 217.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DRAGLSAETERSSSAPQSPHTAPFETFPAPEVLP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PARSRATGGTGLGLAIVKHVVASHGGEVTVWSAEGQGSTFTLRLPEAGLARDRAQRRS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ANVSHELKTPVGALSLLSEAVMDAADDPEAVERFAGRMQIEATRLTNLVQELIDLSRV
                                                       /note="PS00013
                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="SCD8A.03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="SCD8A.03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="SCD8A.02"
                                                           Prokaryotic membrane Lipoprotein Lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               to entry PF00512 signal, Histidine .80, E-value 1.6e-61"
                                                                                                                                                                                                                                                                                                                                                                                                                                             e sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Response
```

.4659

probable transcriptional factor

```
В
                                                                                                                                                                                                                                 14635
                                                                                                                                                                                                                                                                                                                        14695
                                                                                                                                                                                                                                                                                                                                                                                                               14755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14872
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14932
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15400
                                                                                                                                                                                                                                                                            1068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity 51.0 nes 664; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgcgacgggacagcgattcggagcactgctggtcaatcctgggggacccgggggcgtcggc
                                                                                                                                                               gcactacagcaacgaccaggacgcgttcaacgcggtccggtgcgtctatgcgcccacacc
                                                                                                                                                                                                                                                                                                                                                gtacagccctcagcgctggaagtacctgaccagtggtctg---ctggggctgcagcgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GACCGACGCGCTCGTTCAACCGGGAGACCGCGGCCGCCTG----CGAGAAGAACTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGACCTCGTCAGCTTCGACCCGCGCGCGCGTCGGCAAC---AGCCGCGCGCGTGCGCTGCCC
ccttagctacgggcagttcaccggatccgcccccg----cgatctgtgcgcgctgtg
                                            CGCCGACTCCAGCAGCCGCTACACGGTCGCGGACGTCCTGTCCCGCCTGCCGGACTTCAT
                                                                    ggccga-tccagcggc--ctgggtggccgccgaccaacggatccgtcaggtcgccccgtt
                                                                                                                                      GGACGACGCCACGACGAGGAAAGCAACGAGGACGACGCCTTCCGGGCCATCACCTG
                                                                                                                                                                                                                               CGGCGACGTCCTGCACGACCTCGCCGAAGCCCTCGGCCAGCACGGCACCGGTGGCGGCAC
                                                                                                                                                                                                                                                         cagcgacgccggcgacttgctggtgcttgccgacgactatgacggccggggatgcagacgg
                                                                                                                                                                                                                                                                                                                      CTACCGGCAGGACTACTGGCCCGCGCTCCGGGTCGGTCTGGAAGCCGCCGCCGACGACGA
                                                                                                                                                                                                                                                                                                                                                                                                             CACCCGGACGACGCGAACTCGACGGCGACGCCCTCGTCGCGGCCGTCACCGGCGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                     gacgtcggatccacgtggcctgagctacgccgacgcgacgacgggcaccatcaacgcgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGAGGACATCGTGGACCTCGTCGTCGGCCTGGAAGCGGCCCTGGACGACACCCCCCTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ggcccagtgggtcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CTTCGAGCACTTCGCCGCCTGGTGCGCCCG----GCAGGGCTGCACACTGGGCGAGGACGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tttcaatgactacgccgccgactgcgccgctcgccgcctgccctctgggcaccgactc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGACCCGACCCAGGACACGATGGAGGAAGCCCTCGCCCAGGCCGGCGGCTTCCAGCTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgatccagccgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGGCGTCTACGCGCACTTGTTCCCGGGAGCACGTCGGCCGCGCGCCGTACTCGACGGTGTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGGCGACGCCCTCCCCTACGTCGGCACCACCCAGGCCGCCCGGGACATGGACCTGATGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cttcagcttcttggccaatatcggtaccgcgtccgtcgcacgggacatggacatggttcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgtcacccacgtcgaacaggtctaccggcagttggcccaggactgtgttgaccggatggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgacctggtgggcttcgacccgagaggggtcggccactcgacccctgcgttgcggtgtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGTCGCCA-----CCCTTCCGGGCCTGGCCGCCGACTACGAGAAACTCCGCACCCGCTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggtcgacatggtcgccgctatggcacccgcgatcgccgacaccgacattctccgccactt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CACCCGGACGACCGGATCGGCTCCCTGCTTCAACTTCGGCGGCCCCCGGCGCTCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            transcriptional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     regulator, len: 160 aa; similar to TR:053568 (EMBL:AL022075) Mycobacterium tuberculosis pu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11.9%;
51.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 185.2; DB 73; Length 41800
Pred. No. 1.5e-17;
0; Mismatches 588; Indels 36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  regulator RV3583c, 162 aa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fasta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       putative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               scores:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     410
                                                                                         1244
                                                                                                                                                                                                                                                                                                                                                                                                                                                          1010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14873
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14816
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15053
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
```

밁 δÃ 뭐 QY δÃ

밁 Qy 밁 Qy 망 Qy 밁 QΥ 뫄 밁 Q В Ş Вb Qy B Qy Вb QΥ 밁 Q Б

Ş 밁 Qy

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
AR027259
                                                                    δÃ
                                                                                                    망
                                                                                                                               QУ
                                                                                                                                                             В
                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                                               В
               20
                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                       Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14155 CCCGAAGCCCGGCACGGTCTGCGAGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14455
                                                                                                                                                                                                                                                                                                                                                                                                                                                         source
                                                                       448
                                                                                                                                                                                                                        475
                                                                                                                                  388
                                                                                                                                                                                            328
                                                                                                                                                                                                                                                    271
                                                                                                                                                                                                                                                                                              cgctgcgcgacggtgtccgtccccgtcgactacgaccaacccggtgggacacaagcgaag
atggccgactacagtccggccgtcaccccacgtcgaacaggtctaccggcagttggcc
                                                                                                                    gacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggccac
                                                                                                                                                               TTCGGCGGCCCGGCGTCTCCGGCGTCTCCACGATGCC-----GTCCTACGCCGACACC
                                                                                                                                                                                                                       CTCGCGCTGATCCGGTCCCGGGCGAGCGGGGGACGACCGCATCGGCTCCCTGCTGTTCAAC
                                                                                                                                                                                                                                   ttggcggtgatccgcgtga---cgggacagcgattcggagcactgctggtcaat 327
                                                                                                                                                                                                                                                                              tcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgtaccggcgcgatccg
                                                                                                     cctgggggacccgggcgtcggcggtcgacatggtcgccgctatggcacccgcgatcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccgccgacgagtctgcggtgcgcgccc 1557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gttcgatggcaaccagtgtgtgggactctgcgggtgatgcactattttctcgacgggacctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGAGGCCTCCCCCCTTTCGGCCCCCGGCCTCGCCTGGAGCACCCTGTCCTGCGACGGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGACAGCGGCAACACCTGCGTCCGGAACGCCGTCGACGCCTACCTGCTGAACGGCACCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCGCCTCGGCGAGAAGGTGGGCGTCGAGCTGACGTACGAGGGCGAGGGCCACGGCGCCTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ccagctgggcgcaccgct-----gatcaccttcgacggcacccaacacactgcggt 1469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCTCGTCGGCAACACCGGCGACCCCGCCACCCCCTACGAGGGCGCCGCCGCCATGGCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgtggtgtccacccacccacgacccggccactccgtatcagtccggggtagacctggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCGGTCCCCGGAGCGGCCCGGCACCCCGAGGTCAGCGCCCCGGGCGCGCCCCCGGTCCT
                                          -CCAGCGAGGGCGTCCGCTGCCGCACCGACGAGGCGATCGAGGCCGCCGAGTCGGTGGAC
                                                                                                                                                                                                                                                                                                                                      tch 10.1%; al Similarity 49.7%; 663; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
AR027259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Unclassified.

1 (bases 1 to 1777)

Bartfeld, D., Butler, M.J., Hadary, D., Jenish, D.L., Krieger, T.J., Bartfeld, D., Butler, M.J., Walczyk, E., Krygsman, P. and Garven, S. Streptomyces proteases and methods for improved secretion of recombinantly-expressed proteins Patent: US 5856166-A 5 05-JAN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Unknown.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AR027259.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AR027259
                                                                                                                                                                                                                                                                                                                                                                                                                              288
                                                                                                                                                                                                                                                                                                                                                                                                                              QJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              σ
                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="unknown"
607 c 666 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             from patent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dq
                                                                                                                                                                                                                                                                                                                                      Score 158.2;
Pred. No. 3.4e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5856166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14128
                                                                                                                                                                                                                                                                                                                                                                                                                            216
                                                                                                                                                                                                                                                                                                                                      2; DB 81;
3.4e-13;
hes 618;
                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                      1777;
                                                                                                                                                                                                                                                                                                                                         54;
                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                               474
                567
                                                                                                                                                             588
                                                                                                                                                                                                                     534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1418
                                                                                                       646
                                                                                                                                                                                          387
                                                                                                                                                                                                                                                                                                          270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14336
                                                                                                                                                                                                                                                                                                                                         8
```

```
Qy
                                                                                                     Вb
                                                                                                                            Ş
                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
밁
                    Qy
                                                 В
                                                                                                                                                       Дb
                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                          õ
                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뫄
                                                                                                       1573
                                                                                                                                1408
                                                                                                                                                         1513
                                                                                                                                                                                    1348
                                                                                                                                                                                                                                                                                            1228
                                                                                                                                                                                                                                                                                                                                                1168
                                                                                                                                                                                                                                                                                                                                                                           1279
                                                                                                                                                                                                                                                                                                                                                                                                                               1222
                                                                                                                                                                                                                                                                                                                                                                                                                                                       1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  706
             gacgggaccttgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            caaatggcgggatttcagaccgctttcaatgactacgccgccgactgcgccgctcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gacctggccgccagctggg-----
                                                                                                                                                         GCCCCGGTCCTGGTGGTCGGCAACACGGGCGACCCGGCCACGCCCTACGAGGGCGCCCCGC
                                                                                                                                                                    ggcaaggtcgtcgtggtgtccaccaccaccaccggccactccgtatcagtccggggta
                                                                                                                                                                                                                                                                 GAGAAGGTCTCTCCCGTCTTCGGCGCC
                                                                                                                                                                                                                                                                               cgtcaggtcgccccgttccttagctacgggcagttcaccggatccgcccccccgcgatctg
                                                                                                                                                                                                                                                                                                                                                                                    gacggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                         ctgctggggctgcagcgcggcagcgacggcgacttgctggtgcttgccgacgactat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acgacgggcaccatcaacgcgctgtaccagccctcagcgctggaagtacctgaccagtggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CAGGCCAGGGGTTTCCAGCGCGCGCGGGACGACTACCTGGAGTCGACCGGCCAGGAACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctcgga
                                                   CACGGTGCCTACGGGAACGGAAGCGACTGTGTCGACTCCGCGGTGGACGCCTACCTGTTG
                                                                                                                                                                                                                             tgcgcgctgtggccggtgccggcaacgtcgacgccgcacccccgcggcgccgggcgcggggct
                                                                                                                                                                                                                                                                                                                   TGCCTGGACGACAGCAGAGGCCGACCGTGGAGGAGGACGAAGAAGCTGCTGCCGAGGTTC
                                                                                                                                                                                                                                                                                                                                           tgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatc
                                                                                                                                                                                                                                                                                                                                                                        AACGAGCGTGATCCCTCGGGGCGCCTACGGCACGACGACCCACTCGCAAAGGGTCATATCG
                                                                                                                                                                                                                                                                                                                                                                                                                           CTGAAGGCGGCCGAGGAGG----GCGACGGCTCGGAGTTGCTGGCCCTCGCCGACGGCTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TTCACCGGCATCGTGCCGCTGTACAGCGAGAGCGGCTGGCCCGGCCCTGACCAGTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGCGTGATCCTCGACGCGGTGGTGGACCCGGGCGCCGACACGATGGGCCACGCCGAGAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCCGCGACATGGACCTGATGCGGCACGTCCTGGGCGACGAGGAGGATGCACTACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TCCACGCCGGACTCCCCGGCCGAGGAGCAGGCCTACCTGAAGGACGCCGCCGACTTCGGC
                                                                                                      AGGATGGCGGACGAGCTGGGCAAGGACGTCGGCGTGCTGACCTGGCAGGGCGAGGGA
                                                                                                                                                                                                             TGCCACGACTGGCCGGTCGCCGGTCAGCACGAGACCGCGGAGGTGAGCGCGCCCGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              · GGCCGCCGGCAAGCTCATGGAACACGTCTCGACCACGGACACG
                                                                                                                     -cgcaccgctgatcaccttcgacggcacccaa
                                                                                                                                                                                                                                                                 -TTCCTCGGCTGGGACACGGCCGGGTGG
                                                                                                                                                                                                                                                                                                                                             1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                     1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1101
                                                                            1518
                                                                                                                                                                                  1407
                                                                                                                                                                                                                                                                                          1287
                                                                                                                                                                                                                                                                                                                                                                                                  1167
                                                                                                                                                                                                                                                                                                                                                                                                                            1278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1062
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1002
                                                   1692
                                                                                                                                                                                                                                       1347
                                                                                                                                                                                                                                                                 1452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                765
```

RESULT I38961

10

```
JOURNAL
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LOCUS
DEFINITION
ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KEYWORDS
SOURCE
Дb
                     δÃ
                                            B
                                                                Qγ
                                                                                         Дb
                                                                                                              Qy
                                                                                                                                        рь
                                                                                                                                                         δõ
                                                                                                                                                                                      Ъ
                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                    γQ
                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         883
                                                                                                                                                                 889
                                                                                                                                                                                        823
                                                                                                                                                                                                                                       766
                                                                                                                                                                                                                                                            568
                                                                                                                                                                                                                                                                                     706
                                                                                                                                                                                                                                                                                                           508
                                                                                                                                                                                                                                                                                                                                   647
                                                                                                                                                                                                                                                                                                                                                          448
                                                                                                                                                                                                                                                                                                                                                                                  589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     271
                                                                                                                                                                                                                                                                                                                                                                                                        388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GAACAGGGGTCGCGGAAGATCGCCGGCCTG
                  gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac
                                                          CGCGTGATCCTCGACGCGGTGGTGGACCCCGGCGCGACACGATGGGCCACGCCGAGAAC
                                                                                                     gcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagc
                                                                                                                                                     tacagctacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgg
                                                                                                                                                                                                  gcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctcgga
                                                                                                                                                                                                                                                           atggccgactacagtccggccggcgtcaccccacgtcgaacaggtctaccggcagttggcc
                                                                                                                                                                                                                                                                                                                                               tcgacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgctaccggcgcgatccg
                                                                                                                                                                                                                                                                                                                                                                                 GTCTCCTCCTGCACGAGCGGTACGACCTGGTGAGCTGGGACCCGCGGGGGGTGGCCG--
                                                                                                                                                                                                                                                                                                                                                                                             gacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggccac
                                                                                                                                                                                                                                                                                                                                                                                                                            TTCGGCGGCCCGGCGCCTCCGGCGTCTCCACGATGCC----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTCGCGCTGATCCGGGTCCCGGGGGGGGGGGGGGGGCGCCGCATCGGCTCCCTGCTGCTTCAAC
                                                                                                                                       ATCTCCTACGGCACCGAACTCGGCGGCGTCTACGCCCATCTGTTCCCCGAGCACGTGGGC
                                                                                                                                                                                       GCCCGCGACATGGACCTGATGCGGCACGTCCTGGGCGACGAGGATGCACTACTTCGGC
                                                                                                                                                                                                                                      AGGGGCTGCGAGAA - - - GGCCGCCGGCAAGCTCATGGAACACGTCTCGACCACGGACACG
                                                                                                                                                                                                                                                                                    TCCACGCCGGACTCCCCGGCCGAGGAGCAGGCCTACCTGAAGGACGCCGCCGACTTCGGC
                                                                                                                                                                                                                                                                                                                                   -CCAGCGAGGGCGTCCGCTGCCGCACCGACGAGGCGATCGAGGCCGCCGAGTCGGTGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         al Similarity 49.7
663; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 (bases 1 to 1777)
Hadary,D., Bartfeld,D., Butler,M.J., Jenish,D.,
Malek,L.T., Soostmeyer,G. and Walcyzk,E.
Streptomyces proteases and improved streptomyces
expression of peptides and polypeptides
Patent: US 5616485-A 5 01-APR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
I38961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unclassified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    138961.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5 from patent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 organism="unknown"
607 c 666 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
1. .1777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1777 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred. No. 3.4e-
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5616485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3.4e-13;
hes 618;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 81;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Krieger, T.,
CTGGAGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      strains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13-MAY-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
1101
                                                                                           1002
                                                                                                                                                             747
                                                                                                                                                                                                              687
                                                                                                                 807
                                                                                                                                         942
                                                                                                                                                                                       882
                                                                                                                                                                                                                                      822
                                                                                                                                                                                                                                                            627
                                                                                                                                                                                                                                                                                    765
                                                                                                                                                                                                                                                                                                           567
                                                                                                                                                                                                                                                                                                                                   705
                                                                                                                                                                                                                                                                                                                                                          507
                                                                                                                                                                                                                                                                                                                                                                                 646
                                                                                                                                                                                                                                                                                                                                                                                                       447
                                                                                                                                                                                                                                                                                                                                                                                                                              588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   270
                                                                                                                                                                                                                                                                                                                                                                                                                                                      387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
```

Š

```
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                   RESULT
STMSLPE
                                                                                                                                                                                                                                                                                                            ACCESSION
VERSION
                                                                                                                    FEATURES
                                                                                                                                                                                                                       REFERENCE
                                                                                                                                  JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                    CUS
FINITION
                                                                                                                                                                            TITLE
                                                                                                                                                                                                         AUTHORS
                                                                                                                                                                                                                                                                 ORGANISM
 RBS
                            gene
                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                            1693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     886
                                                                                                                                                                                                                                                                                                                                                                                                                                           AAGGGGACGGTGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                           gacgggaccttgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CACGGTGCCTACGGGAACGGAAGCGACTGTGTCGACTCCGCGGTGGACGCCTACCTGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gacctggcccgccagctggg-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cacactgcggtgttcgatggcaaccagtgtgtggactctgcggtgatgcactattttctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AGGATGGCGGACGAGCTGGCCAAGGACGTCGGCGTGCTGACCTGGCAGGGCGAGGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTCACCGGCATCGTGCCGCCTGTACAGCGAGAGCGGCCTGGCCGCCCTGACCAGTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    acgacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggt 1047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCCCCGGTCCTGGTGGTCGGCAACACGGGCGACCCCGGCCACGCCCTACGAGGGCCCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGCCACGACTGGCCGGTGGCCGGTCAGCACGAGCCGCGGAGGTGAGCGCGCCCGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgcgcgctgtggccggtgccggcaacgtcgacgccgcaccccgcggcgcccgggccggggct 1347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAGAAGGTCTCTCCCGTCTTCGGCGCCC----TTCCTCGGCTGGGACACGGCCGGGTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TGCCTGGACGACAAGCAGAGGCCGACCGTGGAGGAGGACGAAGAAGCTGCTGCCGAGGTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatc 1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AACGAGCGTGATCCCTCGGGGCGCTACGGCACGACGACCCACTCGCAAAGGGTCATATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTGAAGGCGGCCGAGGAGG---GCGACGGCTCGGAGTTGCTGGCCCTCGCCGACGGCTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctgctggggctgcagcgggcagcgacggcggcgacttgctggtgcttgccgacgactat 1107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               L42759
L42759.1
                                                                                                                                                                                                                             Streptomyces lividans
Streptomyces lividans
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                            Isolation and characterization of two genes encoding proteases associated with the mycelium of Streptomyces lividans 66
                                                                                                                                                                                       Actinomycetales: Streptomycineae; Streptomycetaceae; Streptomyce 1 (bases 1 to 1973)
Binnie,C., Butler,M.J., Aphale,J.S., Bourgault,R., DiZonno,M.A.,
Krygsman,P., Liao,L., Walczyk,E. and Malek,L.T.
                                                                                                                                                                                                                                                                            proteinase; slpE gene.
Streptomyces lividans (strain
                                                                                                                                                                                                                                                                                                                                                    STMSLPE 1973 bp
Streptomyces lividans
                                                                                                                                  96042075
                                                                                                                                               Bacteriol.
                           /clone="p8-2"
181. .1731
/gene="slpE"
181. .184
                                                                                                                   Location/Qualifiers
                                                        /db_xref="taxon:1916"
                                                                       /strain="66"
                                                                                   /organism-"Streptomyces
                                                                                                                                                                                                                                                                                                             GI:940304
                                                                                                                                            177 (21), 6033-6040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1533
                                                                                                                                                                                                                                                                                                                                                                                                                                           1707
                                                                                                                                                                                                                                                                                                                                                      (clone
                                                                                                                                                                                                                                                                                                                                                                     DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -cgcaccgctgatcaccttcgacggcacccaa
                                                                                                                                                                                                                                                                                                                                                      p8-2)
                                                                                                                                                                                                                                                                               66) (clone:
                                                                                      lividans'
                                                                                                                                                                                                                                                                                                                                                    proteinase
                                                                                                                                                                                                                                                                             p8-2)
                                                                                                                                                                                                                                                                                                                                                   28-MAR-1996
(slpE) gene, com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1398
                                                                                                                                                                                                                                                                                                                                                      complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1161
                                        밁
                                                                  Q
                                                                                                В
                                                                                                                          Qy
                                                                                                                                                         밁
                                                                                                                                                                                     Qy
                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
            889
                                                                                                                               568
                                                                                                                                                                                        508
                                                                                                                                                                                                                     647
                                                                                                                                                                                                                                                448
                                                                                                                                                                                                                                                                             589
                                                                                                                                                                                                                                                                                                                                       535
                                                                                                                                                                                                                                                                                                                                                                                               475
                                                                                                  766
                                                                                                                                                            706
                                                                                                                                                                                                                                                                                                          388
                                                                                                                                                                                                                                                                                                                                                                  328
                                                                                                                                                                                                                                                                                                                                                                                                                          271
                                                                                                                                                                                                                                                                                                                                                                                                                                                       415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    211
```

밁 Qy В οy 밁 QΥ В Q В ρ В 밁 δÃ В ρ В δÃ 망 ρ 밁

```
terminator
terminator
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cyctycycyacygtytccytccccytcyactacyaccaacccagtygyacacaagcyaay
tacagctacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgg
                                                                                          gcacgggacatggacatggttcgccaagcgttaggtgacgatcagatcaactacctcgga
                                                                                                                                                                                           atggccgactacagtccggccggcgtcacccacgtcgaacaggtctaccggcagttggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gacaccgacattctccgccacttcgacctggtgggcttcgacccgagaggggtcggccac 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTCGGCGGCCCCGGGCGTCTCCGGCGTCTCCACGATGCC-----GTCCTACGCCGACACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cctgggggacccggggcgtcggcgatcgacatggtcgccgctatggcacccgcgatcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttggcggtgatccgcgtccccgcga---cgggaccagcgattcggagcactgctggtcaat 327
                                                                       GCCCGCGACATGGACCTGATGCGGCACGTCCTGGGCGACGAGGAGGATGCACTACTTCGGC
                                                                                                                                                                 AGGGGCTGCGAGAA - - -
                                                                                                                                                                                                                                                           TCCACGCCGGACTCCCCGGCCGAGGAGCAGGCCTACCTGAAGGACGCCGCCGACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                        togacccctgcgttgcggtgtcgcaccgacgccgagttcgacgcgtaccggcgcgatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                            GTCTCCTCCTGCACGAGCGGTACGACCTGGTGAGCTGGGACCCGCGCGGGGGTGGCCG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTCGCGCTGATCCGGGTCCCGGGCGAGCGGGACCGCATCGGCTCCCTGCTGCTTCAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      663;
                                                                                                                                                                                                                                                                                                                                                -CCAGCGAGGGGGTCCGCTGCCGCACCGACGAGGCGATCGAGGCCGCCGAGTCGGTGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity 49.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="profelinase"
/product="profelinase"
/product="profelinase"
/product="profelinase"
/protein_id="AAA33057.1"
/db_xref="GI:940305"
/translation="MARLVRWTALTAAAALLTAGCSGGSSDEDKDDGGRSSAGPSAAA
/translation="MARLVRWTALTAAAALLTAGCSGGSSDEDKDDGGTIDLALIRSR
ASGDDRIGSLLENFGGFOASGVSTMPSYADTVSSHLERVDLYSWDDRGVAAS:GVRCR
ASGDDRIGSLLENFGGFOAGCYLANADFGRGCEKAAGKLMEHLYSTTDTYALWHDLM
RHVLGDERMHYFGISYGTELGGVYAHLFPEHVGRVILDAVVDPGADTMGHAENQARGF
RHVLGDERMHYFGISYGTELGGVYAHLFPEHVGRVILDAVVDPGADTMGHAENQARGF
QRALDDYLESTGQEPEGGSEKLAGLLERLDAEPLTSSPGRELTOTLAFTGIVLPLYS
ESGWPALTSALKAAEEGDGSELLALADGYNERDPSGRYGTTHSQRVISCLDDKQRPT
VEETKKLLPREKVSPVFGAFLGWDTAGKCHDWPVAGQHETAEVSAPDAAFVLVVGNT
GDPATTYEGARRMADELGKDVGVVLTWQGEGHGAYGNGSDCVDSAVDAYLLKGTVPKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               250. .252
/gene="slpE"
/note="prokaryotic msite; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="by homology; putative"
/function="lipase serine active
1735. .1777
1787. .1827
a 666 c 734 g 251 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /function="attachment
896. .898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKVCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /evidence=experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="slpE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="slpE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="slpE"
190. .1731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             function="hydrolysis of proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10.1%;
49.7%;
                                                                                                                                                              -GGCCGCCGGCAAGCTCATGGAACACGTCTCGACCACGGACACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 158.2; DB 7
Pred. No. 3.2e-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       membrane lipoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          glyceride-fatty
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                618;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1973;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             peptides'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         attachment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          lipid"
                                                                       882
                                                                                                                                                                                                                                                        765
                                                                                                                                                                                                                                                                                                                                                  705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               387
                                                                                                                                                                                                                                                                                                   567
                                                                                                                                                                                                                                                                                                                                                                                             507
                                                                                                                                                                                                                                                                                                                                                                                                                                            646
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
```

```
∕2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вρ
                                                                                                                                                                                                                                                                                                                     Вр
                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 뫄
   SOURCE
                                                                                                                                                                                           SC5H1/c
                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                               VERSION
                                                                                                                                              ACCESSION
                                                                                                                                                             DEFINITION
                                                                                                                                                                            LOCUS
                                                                                                                                                                                                                                                                                                                     1633
                                                                                                                                                                                                                                                                                                                                                                                                                                                     1513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1048
                                                                                                                                                                                                                                                          1693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 943
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                883
                                                                                                                                                                                                                                                          AAGGGGACGGTGCCG
                                                                                                                                                                                                                                                                                                                                   cacactgcggtgttcgatggcaaccagtgtgtgggactctgcggtgatgcactattttctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tgcgcgctgtggccggtgccggcaacgtcgacgccgcacccccgcggcgccggcgggggct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AACGAGCGTGATCCCTCGGGGCGCTACGGCACGACGACCCACTCGCAAAGGGTCATATCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gacggccgggatgcagacggcactacagcaacgaccaggacgcgttcaacgcggtccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CTGAAGGCGGCCGAGGAGG---GCGACGCTCGGAGTTGCTGGCCCTCGCCGACGCTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          acgacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggt 1047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccgctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caaatggcgggatttcagaccgctttcaatgactacgccgccgactgcgccgctcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcgatggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagc
                                                                                                                                                                                                                                                                                    gacgggaccttgccg 1533
                                                                                                                                                                                                                                                                                                                     CACGGTGCCTACGGGAACGGAAGCGACTGTGTCGACTCCGCGGTGGACGCCTACCTGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                 gacctggcccgccagctggg-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCCCGGTCCTGGTGGTCGGCAACACGGGCCGACCCCCTACGAGGGCGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGCCACGACTGGCCGGTGGCCGGTCAGCACGAGACCGCGGAGGTGAGCGCGCCCGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAGAAGGTCTCTCCCGTCTTCGGCGCC----TTCCTCGGCTGGGACACGGCCGGGTGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgtcaggtcgcccgttccttagctacggcagttcaccggatccgcccccccgcgatctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgcgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CTGGACGCCGAGCCACTGCCCACGTCCTCGCCGGGGCGGAGCTGACGCAGACCCTCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAACAGGGTCGCGGAAGATCGCCGGCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgac 927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CAGGCCAGGGGTTTCCAGCGCGCGCGCTGGACGACTACCTGGAGTCGACCGGCCAGGAACCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGCGTGATCCTCGACGCGGTGGTGGACCCCGGGCGCGCGACACGATGGGCCCACGCCGAGAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATCTCCTACGGCACCGAACTCGGCGGCGTCTACGCCCATCTGTTCCCCGAGCACGTGGGC
                                                                                       Streptomyces coelicolor cosmid 5H1.
AL049863
AL049863 CI:8347022
add; adenosine deaminase; ATP-dependent Clp protease; add; chif; Chitinase; clpP3; clpP4; DNA-binding protein; by
Streptomyces
Streptomyces
                                                                   oxidoreductase rorease. There's DNA-binding protein; hydroxy ton channel subunit; isomerase; myo inositol dehydrogenase; oxidoreductase rorease.
                                 regulator.
                                                              oxidoreductase; protease; ribonuclease
                                                 rnhA;
                                                                                                                                                                            36583
 coelicolor A3(2)
coelicolor A3(2)
                                                                                                                                                                                                                                                          1707
                                                 serine/threonine
                                                                                                                                                                         ďď
                                                                                                                                                                          DNA
                                                                                                                                                                                                                                                                                                                                                                                                                 -cgcaccgctgatcaccttcgacggcacccaa
                                                protein
                                                 H; RNA polymerase sigma
kinase; transcriptional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -CTGGAGCGG
                                                                                              hydroxylase;
                                                                                                           bldA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              867
                                                                                                           codon;
                                                                                                                                                                                                                                                                                                                                                     1518
                                                                                                                                                                                                                                                                                                                                                                                    1632
                                                                                                                                                                                                                                                                                                                                                                                                                    1458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              942
                                                                                                                                                                                                                                                                                                                                                                                                                                                     1572
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            repeat_unit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           http://www.nih.go.jp/
http://www.nih.go.jp/
jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted tn
correct initiation codon. Where possible we choose an initiatio
codon (atg, gtg, ttg or (att)) which is preceded by an upstream
ribosome binding site sequence (optimally 5-13bp before the
initiation codon). If this cannot be identified we choose the m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            initiation coun., instrument in the inser ions in the insertion insertion insertion insertions in the insertion insertion insertion insertions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               overlapping sections once, or longe
small overlap between neighbouring
Cosmid 5Hl lies between 2G2 and 5FE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gene prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4/68-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS which show significant similarity to other CDS in the date. The position of possible ribosome binding site sequences are where these have been used to deduce the initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The more significant matches with motifs in the PROSITE database are also included but some of these may be fortuitous. The length in codons is given for each CDS.

Usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta o is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match found by fasta or is given for usually the highest scoring match the highe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CBIO 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. David A. Hopwood, [3] John Innes Centre, Norwich Research Park, Colney, Norwich, Norfolk NR4 7UH, UK
On Jun 8, 2000 this sequence version replaced gi:4835303.
Notes:
Notes:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Direct Submission
Submitted (10-MAY-1999) Streptomyces coelicolor sequencing proje
Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge
CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A set of ordered cosmids and a detailed genetic and for the 8 Mb Streptomyces coelicolor A3(2) chromoson Mol. Microbiol. 21 (1), 77-96 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (URL; http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are numbered using the following system eg SC7B7.01c. SC (S. coelicolor), 7B7 (cosmid name), .01 (first CDS), c (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         by the BBSRC.
Details of S. coelicolor sequencing at the Sanger Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         strand).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Oliver, K. and Harris, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Kinashi, H. and Hopwood, D.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              restriction fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              James,K.D., Parkhill,J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97000351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Redenbach, M., Kieser, H.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Actinomycetales; Streptomycineae; Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (bases 1 to 36583)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 36583)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (bases 1 to
/note="SCSHI.41, hypothetical protein, len: 345 aa; unknown function, similar to part of SCE29.03 unknown function postible target for bldh regulation. There are imperfect inverted repeats at each end of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(179. .238)
/note="55 bp imperfect
                                                                                                                                                                                                                                                                                                                                                                                   /gene="SC5H1.41"
/note="coess"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="SC5H1.41"
complement/~~~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="taxon:100226"
/clone="cosmid 5H1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /strain="A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .36583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Barrell, B.G. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Denapaite, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           inverted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5F8 on the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      be the entire insert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    coelicolor A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   because we arrange
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eichner, A., Cullum, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rajandream, M.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AseI-A genomic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -o is given for DS in the database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        predicted the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       physical map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 initiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           funded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                most
```

```
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     repeat_unit
                                                                                                                                    /product="hypothetical protein"
/protein_id="Cab42964.1"
/protein_id="Cab42964.1"
/db_xref="G1:485342"
/db_xref="SPTREMBL:Q9X7U6"
/translation="MSSHLSADHPAAQSPGQGSVEALISQTRRLRGDVDAVRRDSQDD
/TDPRCRWQRALYDLAHQUTDUDAHLAQLRDGPAPAPRAGSLLSRVGSAEWNLLTDE
AEWSAELFHILGRDPASVPLSLDELPSLVLTEDRPKLTAMVTDCLVDGRPIDGEERVV
RPDGSVRTVHHMGEPVLDADGSTASMAAVLRDVGELRRSQRAVSETRDSLTRRPASPW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   base preference, GC frame analysis and amino composition"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MSKEPNTRLSDLFGLAGWSKGELARLVNRQAAAMGHPQLATDTS
RVRRWLDMGEIRDPVERVLAALFTERLGRVVTIEDLGLVRHGSAGKREHDGSEEHPD
GVPWAPERTAAVLTEETGMDLMLNRRGLVGAGAALAAGSALSGAMHDWLHTDPALAAD
APDLHADPAGFDXYEAAFIGSQEVEELEKSVEVERAWDAARGGGLQRKAVVGQL
NEVGGMLAYHHPPHLQRRLWGVAANLAVLAGWMSHDVGLEPTAQKYFVIAAHAAREGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="SC5H1.40c"
/note="SC5H1.40c, possible regulatory protein, len: 502
/aa; similar to e.g. SW:SP15_STRGR (EMBL.M32687)
Streptomyces griseus sporulation protein (529 aa), fasta scores; opt: 394 z-score: 452.2 E(): 7.2e-18, 27.9%
identity in 530 aa. Similar to SC7A1.26 (EMBL:ALO34447)
S.coelicolor possible transcriptional regulator (500 aa)
                        TWAHASGPAPLLFRGGTGHALSGPDGPAGQDGPSGEAEATLEAGDLLLLHTGALEPEA
VEHLLTLAPRLTAADSAGDGVRLVTRELDGFPGRQDACVLIARVTP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(1287. .1346)
/note="55 bp imperfect inverted repeat"
1648. .3156
                                                                                  EADAYGPAVLIGALRGLALAGTRPGRLRDRLAELLRATALAPVDGAVYCGYRPDTHTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="SC5H1.39, hypothetical protein, len: 438 aa;
unknown function, probable CDS suggested by positional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(3176. .4492)
/gene="SC5H1.39"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(3176.
/gene="SC5H1.39"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QRTWDRLRQMYRLTAEYAGYPKIQELREEIKLALPKGKSPRGKGPGGTVAPA'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DRPRAGEALSRAARQMVHLGKPDEALDLMKLAQSGSGEQVLPRTKAMLYTIEAWAQAS
MGKGQAMRRTLGRAEDLFVSDKADVPPPDWMQTFKEEDLYGMQALAYRTLAEFEPGAA
AHAQHYADKALALRIDGRQRSKIFDYLSMASACFIADDPEQADRYARLALVSMGSNSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="putative regulatory
/protein_id="CAB42965.1"
/db_xref="GI:4835343"
/db_xref="SPTREMBL:Q9X707"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="TTA (leucine) codon, regulation"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(1022. .1024)
/gene="SC5H1.41"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GTFDAPLDYAARISRYHELGLLTDRDLGDLQKLLHGIAHAGGRQGMGQFCHGDALLSN
VLMSPAGPVLVDWEHAGWYLPGYDLATLWAVLGDAPVARRQISQIAQSTGTAARDAFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="MLGAGRARLGAGPGTQPLSGRIDLSGPQGAQLRTAIAAVHRICP
EFSPVQVLRRSGRSVLLVGTTGRSTAVAKCLVDHSPAWAERSRHEIGAYRSFVRQRPP
VRVPRLIAADPDNGTLVIERWPGRVAALQRHPLEAPPRADIRAAIGAVCRLNAWRPPA
                                                                                                                    IGLLRFPDEGRPGLDLAGAHLPPTSATGRRSREGGWYDACPLGADGETLITVGDFGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
/label=SC5H1.40c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="SC5H1.40c"
1648. .3156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RRAVRAAVGTR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VNLMLVLTREIRTYETAVQRSMHDPVGAATGPAHPGAAPTGEEQRLLLRRLHDDCQLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="hypothetical
/protein_id="CAB42966.;
/db_xref="GI:4835344"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                      /label=SC5H1.39
                                                                                                                                                                                                                                                                                                                                                                                                                     trans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (43.0% identity in 491 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
/label=SC5H1.41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:Q9X7U8"
                                                                                                                                                                                                                                                                                                                                                                                                                     _table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .4492)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               possible target for bldA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  fasta
```

```
В
                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                          Ω
                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                    8331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                                                                                                                                                                                              454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hes 430;
GGGGACGGGGGGATGACCGACCCCGAGGGCGTGCTGGAACGACTGCGGGACGCGGCGGCC
                                                                                                                                                                          gactacagtccggccggcgtcacccacgtcgaacaggtctaccggcagttggcccaggac
                                                                                                                                                                                                                                                                                                                                                                                                ACCAA-----CGGCTACGACGTGGTGACCTTCGACCCGCGCGCGCGTCGGCCGGTCCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                         gacattotocgocacttogacotggtgggcttogacocgagaggggttoggcocotcgaco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gcggtgatccgcgtccccgcgacgggacagcgattcggagcactgctggtcaatcctggg 333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TGCGGCAAGGTCACCGTCCCCCTCGATTACTCGCGGCCCCCGCGGCAACCCTCGACGTG 8452
                                                                                                                                                                                                                                                        CCGGTCTCCTGCGGACCGGCCACCCTGAAGATCATGGAGG----
                                                                                                                                                                                                                                                                                                                   cctgcgttgcggtgtcgcaccgacgccgagttcgacgcgtaccggcgcgatccgatggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCCCCGGCGGCATCAACGAACTCGCCCTGGGCGGAAGGAGTTCATGCACCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggacccggggcgtcggcggtcgacatggtcgccgctatggcacccgcgatcgccgacacc 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCCCTGGCCCGGTACCGGGGGCGACCGGGGGGCTCGGTCCTGCTGAACTTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tgcgcgacggtgtccgtcccgtcgactacgaccaacccggtgggacacaagcgaagttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(4765..5793)

complement(4765..5793)

/gene="SC5H1.38", probable myo-inositol dehydrogenase, len:
/note="SC5H1.38", probable myo-inositol Zentydrogenase, len:
/note="SC5H1.38", probable myo-inositol Zentydrogenase (344)
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-score: 958.5 E(): 0, 38.1%
/ fasta scores; opt: 864 z-scores;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="SC5H1.37, hypothetical protein, len: 364 aa; unknown function, similar to TR:P73120 (EMBL:D90903) Synechocystis sp. hypothetical protein (358 aa), fasscores; opt: 492 z-score: 559.6 E(): 7.6e-24, 31.6%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(5804..5808)
/note="possible RBS"
complement(5917..7011)
/gene="SC5H1.37"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aa) (29.8% identity in 228 aa overlap).
match to entry PF01408 GF0_IDH_MocA, Ox
family, score 153.50, E-value 3.6e-42°
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="SC5H1.37"
/note="sc=""
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="Pfam match to entry PF01408 GFO_IDH_MocA.
Oxidoreductase family, score 153.50, E-value 3.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="SC5H1.38"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MAPNSAGALRVVEAEARLGRRLAQIGFMRRYDAEYRQLKSLLDGGRLGRPLMLHCVHR
NVSSPPHFTSAMLINSSVSHEIDAARWLLGQELSAVTVLRPRPSAGAPEGLLDPQLVL
FETEGGAVVDVEVFVNCGFGYEVRCEAVCEAGSARIGAAHTMMVTAAGGAREEVPQDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="putative myo-inositol dehydrogenase"
/protein_id="CAB42963.1"
/db_xref="GI:4835341"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MSELLGVAVLGAGHMGADHIRRVDQVVSGARVAAVADPDAERAK
EAVGGIGGTGRITVHTDVEAALDAPGVEAVLIASPGEAHEEALLAAFARGLPVLCEKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RPSLHDRA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LVRFADAYDREVQSWVDATRRGLVTGPGTWDGYAAAAVAEAGVRALDTGVRTPVDMAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /db_xref="SPTREMBL:Q9X7U5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label=SC5H1.38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred. No. 1.4e-10;
0; Mismatches 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 134.6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .5781)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               429;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 36583;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Oxidoreductase
                                                                                                                                                                                                                                                        -CGACGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3.6e-42"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                 573
                                                                                                                                                                                                                                                                                                                              513
                                                                                                                                                                                                                                                                                                                                                                                                8278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          fasta
                                                                                                                                                                                                                                                        8230
                                                                                                           8170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2,
```

```
Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γQ
                                                                                                                                                                                                                                                                                                                                                          REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
SC9C7/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                               COMMENT
                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FOCUS
                                                                                                                                                                                                                                                                                                                                                                                               AUTHORS
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                    EFERENCE
                                                                                                                  MEDLINE
                                                                                                                                  JOURNAL
                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                           TITLE
                                                                                                                                                                                                                                                                                                                         JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1054 gggctgcagcggcggcgacggcggcggccttgctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8169 GAGTGCGCCAAGTACTCCGGCCCCGTGCTGCCCCACATAGGCACGGTCGACGCGGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggtctgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcgacgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGGGGGCAGCAGCCGCGTGGAGAACTTCCTCGACTGGTGCGTCGAGGACGTCGCCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcgggatttcagaccgctttcaatgactacgccgccgactgcgccgctcgccggcctgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgggcgatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAGTTGCTCGAGGACGGTGACACCCGCGGCCTGGAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCGATCGGCCAGGCCCTGTACAGCCGGGAGTTGTGGCCCTTCGCTGGAGCGGGCACTCGCG 7690
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GACTCCGACCCGGTGCCGTCGGCGTTCGGCGAGCCCTTCACCGGGCAGGACATGGTCGGC 7750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgacccgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagccaaatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TACGGGACCCGGTTGGGGGGGGTCTACGCGGCGGGTTCCCCGGACAAGGTCGGCCGGATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GACATGGACGTGATGCGCCGGGCCCTCGGCGACGACCGGCTCAACTACCTGGGCTTCTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTCCTGGACGGCGTGGACGCTGACGGAACCGCTGGCCGAACAGGGGCTGGCCGGGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          acetyltransferase; acyl-CoA dehydrogenase; acyl-peptide hydrolase; aminoacylase; ccr; coenzyme Bl2-dependent mutase; crotonyl coA reductase; efflux protein; lyase; meaA; oxidoreductase; peptidase; tetR family; transcriptional regulator.
                                                                                                                                Kinashi, H. and Hopwood, D.A.
A set of ordered cosmids and a detailed genetic and physical map for the 8 mb Streptomyces coelicolor A3(2) chromosome mol. microbiol. 21 (1), 77-96 (1996)
                                                                                                                                                                                                                        CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. David A. Hopwood, [3] John Innes Centre, Norwich Research Park, Colney, Norwich, Norfolk NR4 7UH, UK
3 (bases 1 to 31360)
                                                                                                                                                                                                                                                                                                      Sanger Centre, Wellcome Trust Genome Campus, Hinxton,
                                                                                                                                                                                                                                                                                                                     Submitted (08-JAN-1999) Streptomyces coelicolor sequencing project,
                                                                                                                                                                                                                                                                                                                                                      2 (bases 1 to 31360)
Bentley, S.D., Parkhill, J., Barrell, B.G. and Rajandream, M.A.
                                                                                                                                                                                                                                                                                                                                                                                             Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Actinomycetales; Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Streptomyces coelicolor A3(2). Streptomyces coelicolor A3(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AL035161.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomyces coelicolor
                 available on the World Wide Web
                                                          by the BBSRC
                                                                            Streptomyces coelicolor
                                                                                                                 97000351
                                                                                                                                                                                                        Redenbach, M., Kieser, H.M., Denapaite, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                 Seeger, K.J. and Harris, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria;
                                      Details of S.
(URL; http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are
                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 31360)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31360 bp
                                   coelicolor sequencing at the
                                                                        sequencing at The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               907
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1090
                                                                                                                                                                                                                                                                                                                                                                                                                                              Actinobacteridae; entomycetaceae; Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BCT
                                                                                                                                                                                                        Eichner, A.,
                                                                        Sanger
                                     Sanger Centre are
                                                                            Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12-JAN-1999
                                                                                                                                                                                                        Cullum, J.,
                                                                                                                                                                                                                                                                                                      Cambridge
                                                                            is funded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1053
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  873
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7930
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FEATURES
                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
 CDS
                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            coelicolor),
```

```
IMPORTANT: This sequence MAY NOT be the entire insert of the sequenced clone. It may be shorter because we only sequence overlapping sections once, or longer, because we arrange for a small overlap between neighbouring submissions. Cosmid 9C7 lies between 1All and IEG on the AseT-A genomic restriction d fragment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the monotone initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               prediction is based on positional base preference in codons using specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           http://www.nih.go.jp/
jun/cgi-bin/frameplot.pl. CAUTION:
correct initiation codon. Where po
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             are also included but some of these may be fortuitous.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              upstream initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon. Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Usually the highest scoring match found by fasta -o is given for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 in codons is given for each CDS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 numbered using the following system eg SC7B7.01c. s coelicolor), 7B7 (cosmid name), .01 (first CDS), c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 which show significant similarity to other CDS in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        significant matches with motifs in the PROSITE database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(1. .147
/gene="SC9C7.01c"
complement(<1. .14
                                                                                                VADGGDGTVAAAVAAGFERREARVAGPLGEEVTAAVALRGDTAVVEMAEASGLQRLPE
GVLAPLTSSTYGSGELLRAALDAGART LVFGVGGSARTTDGGAGRUAALGARFLDGNGE
PVAPGGGGLACLVSADLSGLDSRLSDVELVLASDVDNPLTGFRGAPAVYGPVQKGASPD
DVTALDAALAHFAKVLERTEGVGARAAEYAASPGAGAAGGIGFGAMLLGARFRPGIEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       note="SC9C7.02, conserved hypothetical protein, len: 380aa; similar to many eg. SW:YXAA_BACSU hypothetical protein from Bacillus subtilis (382 aa) fasta scores; 1045, z-score: 998.9, E(): 0, (46.3% identity in 374)
                            MLDVLGFAPALERADLVITGEGSLDEQTLHGKAPAGVAAAARAAGKEVVAVCGRLALP
AEVLGRAGIRRAYPLTDVEPDVAKCIADAGPILERVAESIARDFLA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                  overlap)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="SC9C7.02"
332. .1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Overlap with
1A11."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
/transl_table=11
product="hypothetical protein
/protein_id="CAA22713.1"
/db_xref="GI:4154060"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SC1A11.2c from Streptomyces coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="SC9C7.01c, partial CDS, unknown, len: 49a overlapping extreme N-terminal region of partial
                                                                                                                                                                                                                                       /product="conserved hypothetical protein"
/protein_id="cAA22714.1"
/db_xref="G1:4154061"
/translation="MDGTRRVLVAADKFKGSLTAVEVAERVTAGLRRVVPDVLVEALP
                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PGGTI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="SC9C7.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone="cosmid 9C7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Streptomyces
/strain="A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="SC9C7.02"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="taxon:100226"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             translation="MTTADYATYIAGLPRVLAGAAAVFRDAAGRVLLVEPNYREGWAL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           31360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .1474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .147)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .147)
.2526)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SC1A11 Streptomyces coelicolor cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   coelicolor A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SC9C7.01c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ŝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  opt:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  most
```

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(3412. .4617)

/gene="SC9C7.05c"
/gene="SC9C7.05c"
/note="SC9C7.05c, possible acyl-CoA dehydrogenase, len:
/note="SC9C7.05c, possible acyl-CoA dehydrogenase from Bacillus
egs. SW.ACDB_BACSU acyl-CoA dehydrogenase from Bacillus
subtilis (379 aa) fasta scores; opt: 520, z-score: 1209.6,
E(): 0, (38.9% identity in 386 aa overlap) and
SW.ACDM_MOUSE acyl-CoA dehydrogenase from Mus musculus
(mouse) (421 aa) fasta scores; opt: 484, z-score: 1178.1,
E(): 0, (40.3% identity in 390 aa overlap). Contains Pfam
match to entry PF000441 Acyl-CoA_dh, Acyl-CoA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="MPEGRLLSTADTLTLGNATCGFMAVYFTTTGILIPHLMGSDESG/translation="MPEGRLSTADTLTLGNATCGFMAVYFTTTGILIPHLMGSDESG/translation="MICAAIFDLFDGLVARKLRSSPMGAELDNLSDLISFGLAPAYFVLV YGMVADDAYQRVAAVGALVVLLAVVLKRLAFFSCVTVKGGTFQGMPSPFGALTVVSIVLLELPFVATLALAIGTARHLMVSRYEYPERGRILLAVAMLSMIVLSMGLLAGWAFDAPSGQ LLLQTGCALQLVMGAVIPLFATARRVNNFRDNRREARAAQLP"

complement(2585. 3241)

/gene="SC9C7.04c"

complement(2585. 3241)

/gene="SC9C7.04c"

/note="SC9C7.04c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="putative acyl-coA dehydrogenase"
/protein_id="CAA22717.1"
/protein_id="CAA22717.1"
/db_xref="G1:4154064"
/translation="MSRLAQTHGLTDVQREILSTVRDFVDKEIIPVATELEHRDEYPQ
/translation="MSRLAQTHGLTDVQREILSTVRDFVDKEIIPVATELEHRDEYPQ
/translation="MSRLAQTHGLTDVQREILSTVRDFVDKEIIPVATELEHRDEYPQ
/translation="MSRLAQTHGLTDVQREILSTVRDFVDKEIINTHFIVAYML
KOHGTQEQKDHFLPRMAAGDIRGAFSMSEPALGSDVSAISKAVRDGEEYVLNQQKMW
KOHGTQEQKDHFLPRMAAGDIRGAFSMSEPALGSDVSAISKAVRDGEEYVLNQQKMW
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKIDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFGFVRPGLTIPGKTDKMG
LTNGGTSSLVAVLVKSDEGHPEGTAPHKSMTTFLVEKEPGFGFFYRPGLTIPGKTDKMG
LTNGGTSSLVAVLTARGFYNDGTAPHKSMTTFLVEKEPGFGFGFTAPHKSMTTFLVEKEPGFGFGFTAPHKSMTTFLVEKEPGFGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGFTAPHKSMTTFLVEKEPGTAPHKSMTTFLVEKEPGTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLTAPHKSMTTFLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "SC907.03c, probable integral membrane protein, possible phosphatidylserine synthase, len: 260aa; similar to many from prokaryotes (all putative) and eukaryotes eg. SW:PSS_YEAST phosphatidylserine synthase from Saccharomyces cerevisiae (275 aa) fasta scores; opt: 187, z-score: 254.6, E(): 6.8e-07, (35.9% identity in 170 aa overlap). Contains possible membrane spanning regions."
           complement(4620.
/gene="SC9C7.06c
                                                                                                                                                                                                                                                                                                                                                                                                GVRYAQQRHTTGKQIAQHQAIQFKLAEMATKVEAAHAMMVNAARKKDSGERNDLEAGM
AKYLASEYCKEVVEDAFRIHGGYGFSKEYEIERLYREAPMLLIGEGTAEIQKMIIGRR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TAKAVAVPATALAAGMLWFFRDPEREITQGRVVSPADGVVQSIMPWKDGRTRVAIFMS PLNVHVNRAPLAGTVTSVEHVPGGFVPAFNKESENNERVVWHFDTELGDIEMIQIAGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  overlap)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                218aa; similar to several hypothetical proteins eg. TR:027105 (EMBL:AE000875) Methanobacterium thermoautotrophicum (223 aa) fasta scores; opt: 405, z-score: 712.9, E(): 2e-32, (39.2% identity in 212 aa
                                                                                                                            dehydrogenase.
                                                                                                                                                                                                                                                                                          complement(3445.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           dehydrogenase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(3412.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARRIVPYVPQGTKVEQGERVGLIRFGSRVDLYLPEGVEVDVEVGQKTVAGVTRIDRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
/product="conserved hypothetical protein"
/protein_id="CAA22716.1"
/db_xref="GI:4154063"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="putative phosphatidylserine synthase"
/protein_id="CAA22715.1"
/db_xref="GI:4154062"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="SC9C7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="SC9C7.03c"
/note="SC9C7.03c,
                                                                                                                                                                               note="Pfam match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                translation="MPHSQTSAPRDSLAGVRLARGASPWLLPTVATAAVSLLRARRSG/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=:
7.06c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7.05c"
                                                                                                                                                                               to entry
                                                                                                                                                                                     PF00441
                                                                                                                                                                               Acyl-CoA_dh,
                                                                                                                                                                               Acyl-CoA
```

CDS gene CDS

gene

CDS

```
Q
                                                                                      δÃ
                                                                                                                         В
                                                                                                                                                          Qy
                                                                                                                                                                                               뫄
                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                      15722
                                                                                                                                                                                                                                                                                                                                                                                                               15833
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           16010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16190
                                                                                                                                                                                               15662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                  633
                                                                                                                                                                                                                                                                                                        573
                                                                                                                                                                                                                                                                                                                                                                                                                                                  453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Sinhes 700;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          96
GGTCCTGGACTCCGTCGGGCCGGACGACGTCTGGTACGACGCCAACCTCAACCAGGA 15483
                                                                                      ggtcctcgacggcgctatcgatccagccgttagcccaatcgaggaaagcatcagccaaat
                                                                                                                         GTACGGCACCTATCTGGGCGCCGTGTACGCCAAGCTCCATCCCGACCGGGTGCGACGGCT
                                                                                                                                               ctacggcaccaagttgggcaccgcttacctggaacggttcggtactcatgtgcgggcgat
                                                                                                                                                                                               GGACGTCGACGCGATCCGCGCGCGCGCGCGCGGAGAAGCTCAACTTCCGGCTACTC 15603
                                                                                                                                                                                                                   ggacatggacatggttcgccaagcgttaaggtgacgatcaagtcaactacctcggatacag
                                                                                                                                                                                                                                                                      GGAC
                                                                                                                                                                                                                                                                                                                                                                        cgactacagtccggccgcgtcacccacgtcgaacaggtctaccggcagttggcccagga
                                                                                                                                                                                                                                                                                                                                                                                                               TCCCGCGCTGGACTGCCTGCC---GGGCCACTTCGACCCGGTGCGCCCCGACTCGCTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                              ccctgcgttgcggtgtcgcccgacgccgagttcgacgcgtaccggcgcgatccgatggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgacattctccgccacttcgacctggtgggcttcgacccgagaggggttgggccactcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGGGCCCGGAGGCAGCCGGGCTGACGCTCGCCGGGGTTCGTCGTCGCTGCCCGCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gggacccggggcgtcggcgacatggtcgccgctatggcacccgcgatcgccgacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCTGTCCCGCGTCCCGCACACCGCCGGGACGTACCAGGGCCCCTTGCTGGTGAACCCCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99tgatccgcgtcccccgcgacgggacagcgattc---ggagcactgctggtcaatcctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGCGTCCCTGGAGGTGCCGCTCGACCACGCGCGCGTCCGCGGCGGCAGGCGGATCACGCTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCCCGCGGCGGCCTGCACTGGGAGAGTGCGCCACGGAGGACTACCCGACGCTCCAGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cycyactyaagaacccyyccygccaaaccccyygtgcyccygtcytgycyccycaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgcgacggtgtccgtcccgtcgactacgaccaacccggtgggacacaagcgaagttggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gagttggaacagctgccgcgagttcatcgccgacaccagcgaaattcgcactgcacgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGTCACCGCCGTACCCGCCGACGCGAGCGCGCACGGCCCGCGCGCCCCGTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---ACGCCGGACGTCGAGCAGGCCAACCTCGCCCGTGCGGAGTCCTTCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(5138. .6157)
/gene="SC9C7.07c"
/note="SC9C7.07c, probable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(5138. .6157)
/gene="SC9C7.07c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="mQFGRTYEEFEVGATYKHWPGKTVTEYDDHLFCLLTMNHHPLHMDANYAEKTTDFGKNVVVGNYIYSLLLGMSVPDVSGKAIANLEIESLKHVAPTFHGDTVYGQTTYLDKWPSKSKNDRGIVHVETKGYKQDGTLVCVFRRKVMVPTETVTKERGGEOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GRPELKEQGK'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="hypothetical protein
/protein_id="CAA22718.1"
/db_xref="GI:4154065"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (185 aa) fasta scores; opt: 342, z-score: 497.2, E(): 2.1e-20, (38.8% identity in 152 aa overlap)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TR:006163 (EMBL:Z95556) from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="SC9C7.06c, unknown, len: 170aa; similar to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 127.8; DB /3, Pred. No. 1.3e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 lyase,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SC9C7.06c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   len: 339aa; similar to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                31360;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                              752
                                                                                                                                                                                                                                                                                                                                                                                                                                                  512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      215
                                                                                                                           15543
                                                                                                                                                                                                                                                                      15663
                                                                                                                                                                                                                                                                                                                                         15723
                                                                                                                                                                                                                                                                                                                                                                                                               15777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15834
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10;
```

7.3%; 46.1%;

Score 113.2; DB 81; Pred. No. 5e-07;

Length

1908;

7;

```
BASE COUNT
ORIGIN
                                                                                                                                                                                          KEYWORDS
SOURCE
                                                                                                                                                                                                                                    DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             γΩ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                   LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                 RESULT 14
AR027257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                         FEATURES
                                                                                                                                              REFERENCE
                                                                                                                                                                                                                         VERSION
                                                                     JOURNAL
                                                                                                    TITLE
                                                                                                                                                                         ORGANISM
                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                           14792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15482
                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                    1464
                                                                                                                                                                                                                                                                                                                                                         gaccttgccgc 1534
                                                                                                                                                                                                                                                                                                                                                                                                                                                              gctggtgcagaagccgggtaagacgtcggatccacgtggcctgagctacgccgacgcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CTACGGTCTGGGCAGCGACCCCGAGCGGGTCGAGGCCGCCTGGTACGCCATGCGGACGGC
                                                                                                                                                                                                                                                                                                                                                                                                                      tgcggtgttcgatggcaaccagtgtgtgggactctgcggtgatgcactattttctcgacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        caaggtcgtcgtggtgtccaccaccacgacccggccactccgtatcagtccggggtaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGAGAAGGCACCCTTCAT------GGTGTGGAACAACGCCTGGTACAACGCCCGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tcaggtcgccccgttccttagctacgggcagttcaccgggatccgcccccccgcgatctgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCGCGACGCCGCCTGGCCGCGGACTGGGACGACGACGACCAGCTGGGACCTGTA 1508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgtctatgcgcccacaccggccgatccagcggcctgggtggccgccgaccaacggatccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGCCCTGGACGCCTCCGGGGACAACGGCTAC----AGCGTCTACACCGCGGTGCAGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cggccgggatgcagacgggcactacagcaacgaccaggacgcgttcaacgcggtccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGCCTCCTACGCCAAGGACGAGGACACCGGCCCGCTGGTCGAGGCGTACGAGAACTTCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gctggggctgcagcgcggcggcggcggcgacttgctggtgcttgccgacgactatga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCTGGCCAAGCGGCCGGCGGCGGGAAGG-----TCGGCGCGCCTCCGAGCTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ctgccctctgggcaccgactcggcccagtgggtcaaccgctaccacgccctggttgaccc
                                                                                                                                                                                                                                                                                                                                           AACGGTGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                      CATCACGCTGAGCGGGAACGACTGCCTGGACGAGCACCTGGCCGCCTACCTGACCGACGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCCGGTCCTGCTTCCAGGCGACCGGCGACGCGGCCACGCCGTACGAGGGCGCGTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGCGTTCTGGCCCACGGGGTCGGGCAGCCGGTGGACGTCGCCAAC - - - GGCGAGCTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGACACCTACATGCCGGGCGGGTACTACAACGGCTACTGGCCCTACCTGGCCGAGGCGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gacgggcaccatcaacgcgctgtacagccctcagcgctggaagtacctgaccagtggtct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCTCGCCTTCAACGACCGCCACCGGGCGTTCCTGGCCTGGATCGCCGAGCACGACGCGC
                                                                                                                                                                                                                                    AR027257
Sequence 1
AR027257
                                                                   1 (bases 1 to 1908)
Bartfeld,D., Butler,M.J., Hadary,D., Je
Malek,L.T., Soostmeyer,G., Walczyk,E.,
Streptomyces proteases and methods for
recombinantly-expressed proteins
Patent: US 5856166-A 1 05-JAN-1999;
                                                                                                                                                                            Unknown
                                                                                                                                                               Unclassified
                                                                                                                                                                                            Unknown.
                                                                                                                                                                                                                        AR027257.1
             322
          /organism="unknown"
753 c 608 g
                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                           14782
                                                                                                                                                                                                                                                   from
                                                                                                                                                                                                                        GI:5938097
                                           .1908
                                                                                                                                                                                                                                                  1908 bp
rom patent
                                                                                                                                                                                                                                                   SD
                                                                                                                                                                                                                                                     5856166
             225
                                                                                                 Jenish,D.L., Krieger,T.J.,
Krygsman,P. and Garven,S
or improved secretion of
                                                                                                                                                                                                                                                                   29
                                                                                                                                                                                                                                                                   -SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15195
                                                                                                                                                                                                                                                                                                                                                                                                                                1523
                                                                                                                                                                                                                                                                                                                                                                                                                                                              14853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        14913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15423
```

```
В
                                                                     Qy
                                                                                                   В
                                                                                                                         Qγ
                                                                                                                                                                          Ωy
                                                                                                                                                                                                         В
                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                              Db
                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
Matches 669; Conserv
1132
                                                                                                    1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       613
                                                                                                                                                      967
                                                                                                                                                                               780
                                                                                                                                                                                                         907
                                                                                                                                                                                                                                                            847
                                                                                                                                                                                                                                                                                     660
                                                                                                                                                                                                                                                                                                               790
                                                                                                                                                                                                                                                                                                                                         600
                                                                                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                                                                                                                                                                                                                                                      673
                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             197
                                                                                                                                                                                                                                 720
                                                                                                                                                                                                                                                                                                                                                                  733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12
                                                                                                                                                                                                                                                                         aggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgctta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GAAGAAGCCGCTGGGCCGTCGTCGGACCGGCCGAGCTGATCTCCTTCTTCCAGAGCGC
                                                             ggtcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgga
                                                                                                                ctacgccgactgcccgctcgccggcctgccctctgggcaccgactcggcccaytg
                                                                                                                                                                     cgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatga
                                                                                                                                                                                                                      cctggaacggttcggtactcatgtgcgggcgatggtcctcgaccggcgctatcgatccagc
                                                                                                                                                                                                                                                                                                                            cttggccaatatcggtaccgcgtccgtcgcacgggacatggacatggttcgccaagcgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGGCTTCGACCCGCGCGCGTCGGCCACTCCGCGCCCATCTCCTGCGTCGACCCGCAGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgccgctatggcacccgcgatcgccgac---accgacattctccgccacttcgacctggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cggtgggacacaagcgaagttggcggtgatccgcgtccccgcgacggga-----ca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cagcgaaattcgcactgcacgctgcgcgacggtgtccgtcgccgtcgactacgaccaacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tgcgccggtcgtggcgccacacagagttggaacagctgccgcgagttcatcgccgacac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cctagcagcgccccgttggccggcgactgaagaacccggcgccggccaaaccccggg
                    tecaegtggeetgagetaegeegaegegaegggeaecateaaegegetgtaeageee 1019
                                              CCTCGGCGACACCCGCGCGCGAGGTCCAGGACCAGTGGCTGAAGCTGCGCGCCGCCGCCGC
                                                                                                 CTTCGAGGGCCGCTGGAAGGACTGGCAGGACTGGGTCGCCGCGAACGACGCCGCCTACCA
                                                                                                                                                     CCGCGACAAGATCTGGTACCAGGCCAAC-----
                                                                                                                                                                                                   CGGCACCCTCTTCCCGGACCACGTCCGCCGCATGGTCGTCGACAGCGTCGTCAACCCGTC
                                                                                                                                                                                                                                                           CCCGCACATGACC---ACGCCGAACACCGCGCGCGCGCCTCGACGTCATCCGCGCCCCT
                                                                                                                                                                                                                                                                                                                                                                 GCGC----AAGCTCGCCCGCGAGTACGCCGAGGGCCTGCTTCGAGCGCAGCGGCGAGATGCT
                                                                                                                                                                                                                                                                                                                                                                                 cgtcgaacaggtctaccggcagttggcccaggactgtgttgaccgggatgggcttcagctt
                                                                                                                                                                                                                                                                                                                                                                                                                      GTTCGTCAAGGCACCCAAGGCCGACCCCGTGCCCGGCTCCGAGGCCGACAAGCGCGCCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                     GGCCCGCGTCACGAACAAGAGCGCGGCCTCTGGGCCCAACACGGCCAAGGCCTACGACTTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTACGGCAAGCAGATCAGGCTCGCCGTCGACCGCATCGGCAACACCGGAACCAGGAGCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAACCTGCCCAAGCCCATCCAGTGCGGCTACGTCACGGTGCCGATGGACTACGCCAAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCGCCGCCGCCGCCC----CGGGCGGCCATCGACTGGGAGGACTGCGCAGCCGACTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCACTGGTCACCGCCACGCTGATCGCCGGCGCCGCTCTCGGCACCCGCCGCGAGCGCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcgccgcagaccgttgagctcggcgctgctgtccttcgggttgctgctcggcggactgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                     -CTGGACCAGGACGTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
1191
                                                1131
                                                                                                   1071
                                                                                                                                                                                                                                                                                                                                                                                            599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               191
                                                                         959
                                                                                                                           899
                                                                                                                                                     1011
                                                                                                                                                                                                         966
                                                                                                                                                                                                                                 779
                                                                                                                                                                                                                                                           906
                                                                                                                                                                                                                                                                                     719
                                                                                                                                                                                                                                                                                                               846
                                                                                                                                                                                                                                                                                                                                         659
                                                                                                                                                                                                                                                                                                                                                                  789
                                                                                                                                                                                                                                                                                                                                                                                                                     732
                                                                                                                                                                                                                                                                                                                                                                                                                                               539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     71
```

Q

밁 Š

Вþ

492

432

479

419 552

```
DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                        BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Locus
                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                             OURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1612
   192
                                      317
                                                                                                           257
                                                                                                                                                                                197
                                                                                                                                           72
                                                                                                                                                                                                                12
                                                          tgcgccggtcgtggcgccgcaacagagttggaacagctgccgcgagttcatcgccgacac
                                                                                                       GCACTGGTCACCGCCACGCTGATCGCCGGCGCGCGTCTCGGCACCCGCCGAGCGCCGCC
                                                                                                                                                                                                  gatcaccttcga 1448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gacgccgcaccccgcggcgccggccgggggctggcaaggtcgtcgtggtgtccaccaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcagttcaccggatccgcccccgcgatctgtgcgcgctgtggccggtgccggcaacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caacgaccaggacgcgttcaacgcggtccggtctatgcgcccacaccggccgatcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgacttgctggtgcttgccgacgactatga---cggccgggatgcagacgggcactacag
TGACGCCGCCACCCCGTACGAGGGCGCCGTCGAACTGCACCAGCGGTTCCGGGGGATCCCG 1611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgacccggccactccgtatcagtccggggtagacctggcccgccagctgggcgcaccgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GACCTGGGCCAACGCCTGGATGAACCTGCCCTGTGCCACCTGGCCGGTCAAGCAGCAGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         agcggcctgggtggccgccgaccaacggatccgtcaggtcgccccgttccttagctacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCTGATCACCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCCGCTGAACGTGAAGACCGGCAAGGGACTTCCGCCGGTGCTGATCGTCCAGTCCGAGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGCCAACTGGCGCACCTGGGGACCGGGACAACACCCGGGCTCCACCGCGACCACCCGTTCAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTCCGCGGAGAACGGCAACGCCGTCTACACGGCCGTCGAGTGCACCGACGCCAAGTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGACACCCAGGCGCTCGTCGACGCCGCCGCCCCGACCTGTCCGACACCGCGGGCAACGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCCGTACTACGACTCCGCCTGGGCGCCGACCGCGGAGATCTTCAGCAAGTACGTCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                      1 (bases 1 to 1908)
Hadary,D., Bartfeld,D., Butler,M.J., Jenish,D., IMalek,L.T., Soostmeyer,G. and Walcyzk,E.
Streptomyces proteases and improved streptomyces expression of peptides and polypeptides
Patent: US 5616485-A 1 01-ARR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     138959 1908 bp
Sequence 1 from patent
138959
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Unclassified.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     138959.1
                                                                                                                                                                                                                                                 Similarity 46.1
                                                                                                                                                                                                                                                                                                                                                         organism="unknown"
753 c 608 g
                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GI:2083439
                                                                                                                                                                                                                                                                                                                                                                                         .1908
                                                                                                                                                                                                                                                                 7.3%;
                                                                                                                                                                                                                                                 Score 113.2; DB 81;
Pred. No. 5e-07;
0; Mismatches 743;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5616485.
                                                                                                                                                                                                                                                                                                                                                         225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PAT
                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Krieger, T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        13-MAY-1997
                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                for
   251
                                                                     191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1079
                                                                                                         316
                                                                                                                                                                                                                                                 7;
                                                                                 Qy
                                                                                                                       В
                                                                                                                                                      ρy
                                                                                                                                                                                            В
                                                                                                                                                                                                                           δã
                                                                                                                                                                                                                                                                   Ър
                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                  1257
                                                                                                                                                                                                                                 1080
                                                                                                                                                                                                                                                                   1192
                                                                                                                                                                                                                                                                                                                                       1132
                                                                                                                                                                                                                                                                                                                                                                                                          1072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1012
                                                                                                                                                                                                                                                                                                                                                                                                                                            900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   907
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              303
                                                                                                                                             caacgaccaggacgcgttcaacgcggtccggtgctatgcgcccacaccggccgatcc
cgacttgctggtgcttgccgacgactatga---cggccgggatgcagacgggcactacag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ctacgccgccgactgcgccgcccgcccgccctctgggcaccgactcggcccagtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gggcttcgacccgagaggggtcggccactcgacccctgcgttgcggtgtcgcaccgacgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAACCTGCCCAAGCCCATCCAGTGCGGGCTACGTCACGGTGCCGATGGACTACGCCAAGCC
                                                    CGCCAACTGGCGCACCTGGGACCGGGACAACACCCGGGCTCCACCGGGACCACCCGTTCAT
                                                                                                                       CTCCGCGGAGAACGGCAACGCCGTCTACACGGCCGTCGAGTGCACCGACGCCAAGTGGCC
                                                                                                                                                                                              CGACACCCAGGCGCTCGTCGACGCCGCCGCCCCGACCTGTCCGACACCGCGGGCAACGC
                                                                                                                                                                                                                                                                   CCCGTACTACGACTCCGCCTGGGCGCCGACCGCGGAGATCTTCAGCAAGTACGTCGCCGG
                                                                                                                                                                                                                                                                                     GAAGAAGCCGCTGGGCGGTCGTCGGACCGGCCGAGCTGATCTCCTTCTTCCAGAGCGC
                                                                                                                                                                                                                                                                                                                                                          tccacgtggcctgagctacgccgacgcgacgacggcaccatcaacgcgctgtacagccc
                                                                                                                                                                                                                                                                                                                                                                                                          CCTCGGCGACACCCGCGCGGAGGTCCAGGACCAGTGGCTGAAGCTGCGCGCCGCCGCCGC 1131
                                                                                                                                                                                                                                                                                                                                                                                                                                       ggtcaaccgctaccacgccctggttgacccgctggtgcagaagccgggtaagacgtcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CTTCGAGGGCCGCTGGAAGGACTGGCAGGACTGGGTCGCCGCGAACGACGCCGCCTACCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCGCGACAAGATCTGGTACCAGGCCAAC-------CTGGACCAGGACGTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgttagcccaatcgaggaaagcatcagccaaatggcgggatttcagaccgctttcaatga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGGCACCCTCTTCCCGGACCACGTCCGCCGCATGGTCGTCGACAGCGTCGTCAACCCGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cctggaacggttcggtactcatgtgcgggcgatggtcctcgacggcgctatcgatccagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aggtgacgatcagatcaactacctcggatacagctacggcaccaagttgggcaccgctta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCCGCACATGACC----ACGCCGAACACCGCGCGCGCGACCTCGACGTCATCCGCGCCGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCGC----AAGCTCGCCCGCGAGTACGCCGAGGGCTGCTTCGAGCGCAGCGGCGAGATGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgtcgaacaggtctaccggcagttggcccaggactgtgttgaccggatgggcttcagctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GTTCGTCAAGGCACCCAAGGCCGACCCCGTGCCCGGCTCCGAGGCCGACAAGCGCCCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGGCTTCGACCCGCGCGCGTCGGCCACTCCGCGCCCATCTCCTGCGTCGACCCGCAGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GGCCCGCGTCACGAACAAGAGCGCGGTCTGGGCCAACACGGCCCAAGGCCTACGACTTCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgccgctatggcacccgcgatcgccgac---accgacattctccgccacttcgacctggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCGCCAGGGCGCCTGATCTACAACCCCGGCGGTCCCGGCGGCTCCGGCCTGCGTTTCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gcgattcggagcactgctggtcaatcctgggggacccgggggcgtcggcggtcgacatggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTACGGCAAGCAGATCAGGCTCGCCGTCGACCGCATCGGCAACACCGGAACCAGGAGCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cggtgggacacaagcgaagttggcggtgatcccgcgtgacgggga-----ca
```

Ωy В Ş В

밁

밁 δÃ В γQ Ъ δõ

Š 망 δÃ В Q 밁 Q

> 1196 1311

1371

1431

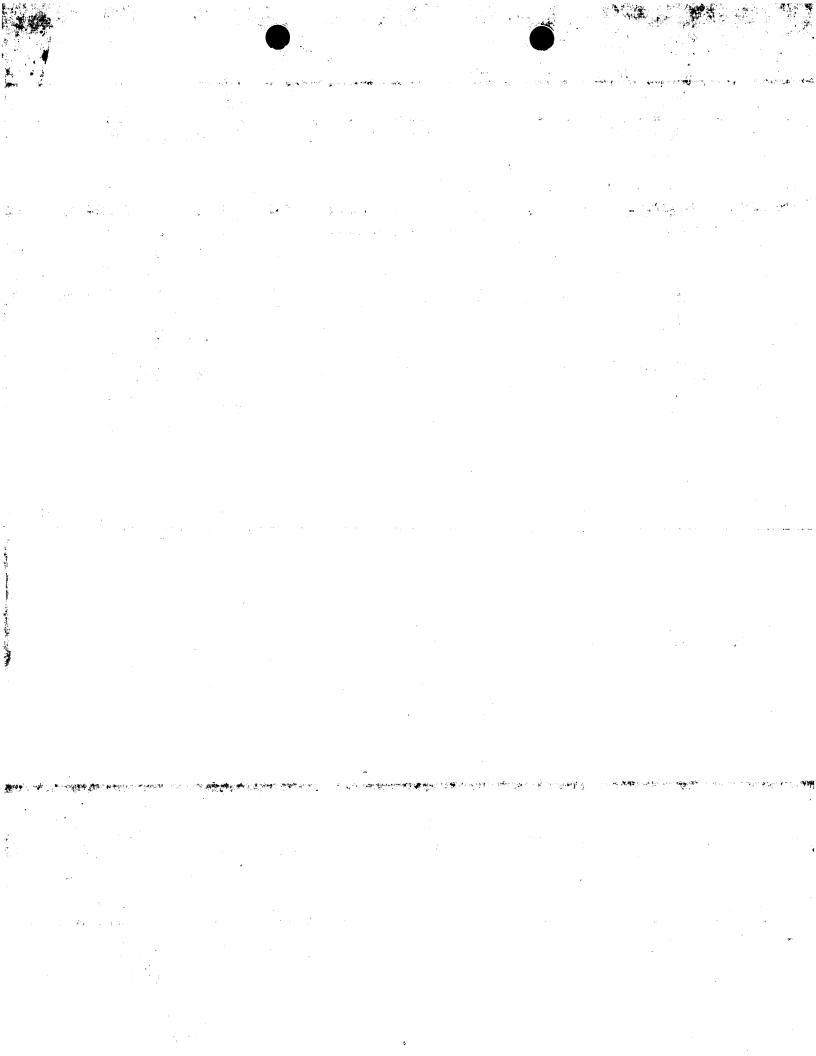
1251 1079 1191 1019 1071

101

966 779 906 719 846 659 789 599 732 539

959

Search completed: January 12, 2001, 20:03:20 Job time: 26374~sec



```
Result
                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                              Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OM protein - protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tal number
                                                                                                                                                                                  No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 on:
8
10
11
12
12
13
14
14
15
16
16
18
                                                                                                                                                                                                                           Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                             780
648.5
583.5
570.5
547.5
529
379
298.5
261
260.5
128
123.5
123
119
117
117
117
                                                                                                                                                                                 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                 seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of
                                                                                                                                                                                                                                                                                                                                                                  SPTREMBL_15:*
1: sp_archea:*
2: sp_bacteria
3: sp_fungi:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                 length:
                                                                                                                                                                                 Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                           length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                 7:
8:
9:
10:
11:
12:
13:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
Gapop 10.
374700 seqs, 117207915 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-461-774-4
2738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                January 5, 2001, 14:30:29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAMWRRRPLSSALLSFGLLL....
                                                                                                                                                                                                                                                                                                             sp_phage: *
                                                                                                                                                                                                                                                                                                                                                                 sp_fungi:*
                                                                                                                                                                                                                                                                                                                                                                           sp_bacteria:*
                                                                                                                                                                                                                                                                                                                                                                                   sp_archea:*
                                                                                                                                                                                                                                                                                                                     sp_organelle: *
                                                                                                                                                                                                                                                                                                                               sp_mhc:*
                                                                                                                                                                                                                                                                                                                                       sp_mammal:*
                                                                                                                                                                                                                                                                                                                                                  sp_invertebrate:*
                                                                                                                                                                                                                                                                                                                                                         sp_human:*
                                                                                                                                                                                                                                                               sp_unclassified:*
                                                                                                                                                                                                                                                                          sp_vertebrate:*
                                                                                                                                                                                                                                                                                sp_virus:*
                                                                                                                                                                                                                                                                                            sp_rodent:*
                                                                                                                                                                                                                                                                                                   sp_plant:*
                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                  2000000000
537
543
549
528
528
525
525
433
3122
11245
11051
11079
374
3654
                                                                                                                                                                                  В
Gapext 0.
                                                     Q9PB15
005685
Q9RD72
P89459
                                                                                                 Q9X7U3
Q9L2G7
                                                                                                                  Q54399
Q54399
Q9L0Q0
Q9L0Q1
Q9ZBJ5
Q54410
Q69831
                                                                                          P71969
                                                                                                                                                                                 H
                                                                                                                                                                                                                                                                                                                                                                                                                summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sw model
                                                                                                                                                                                                           SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .... AVMHYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Search time 115.27 Seconds (without alignments) 527.725 Million cell updates/sec
                      Q9rd72 streptomyce
P89459 herpes simp
O9r154 streptomyce
P70745 arthrobacte
O50399 mycohartr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            374700
                                                           054398 streptomyce
054399 streptomyce
091090 streptomyce
092bj5 streptomyce
054410 streptomyce
054411 streptomyce
092713 streptomyce
091297 streptomyce
091297 streptomyce
091297 streptomyce
091297 streptomyce
091297 streptomyce
                                                                                                                                                                                Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            519
```

O64481 arabidopsis	064481	10	815	3.9	108	45
Q9xah5 streptomyce	Q9XAH5	N	588	3.9	108	44
Q9rty1 deinococcus	Q9RTY1	N	525	3.9	108	43
Q9za45 streptomyce	Q92A45	N	751	4.0	108.5	42
Q9rtj3 deinococcus	Q9RTJ3	Ν	574	4.0	108.5	41
Q9rrh6 deinococcus	Q9RRH6	N	383	4.0	108.5	40
O53348 mycobacteri	053348	N	1055	4.0	109	39
O69970 streptomyce	069970	ນ	725	4.0	109	38
Q9n9n9 leishmania	Q9N9N9	Ŋ	1413	4.0	109.5	37
Q9k3z7 streptomyce	Q9K3Z7	2	524	4.0	109.5	36
Q9zi59 pseudomonas	Q9ZI59	N	282	4.0	109.5	35
Q50004 mycobacteri	Q50004	2	429	4.0	110	34
Q9s200 streptomyce	Q9S200	N	2082	4.0	110.5	S
Q54959 streptomyce	Q54959	N	2591	4.1	111	32
Q9j6k9 rubella vir	Q9J6К9	12	2129	4.1	111.5	31
P71750 mycobacteri	P71750	N	643	4.1	112	30
Q9zga4 streptomyce	Q9ZGA4	ນ	7576	4.1	112.5	29
Q49940 mycobacteri	Q49940	2	1815	4.1	112.5	28
Q9nel4 leishmania	Q9NE14	G	1603	4.1	112.5	27
Q13855 homo sapien	Q13855	4	274	4.1	112.5	26
P96419 mycobacteri	P96419	N	1400	4.2	114	25
	Q9KIE0	N	7525	4.2	115	24
Q911j5 streptomyce	Q9L1J5	N	532	4.2	115	23
O86673 streptomyce	086673	2	447	4.2	115	22
Q91521 amycolatops	Q9L521	ν	92	4.2	115	21
Q914x3 streptomyce	Q9L4X3	N	9477	4.2	116	20

ALIGNMENTS

```
RESULT
Q54398
 SPECIES=S.lividans; STRAIN=66;
MEDLINE=96042075; PubMed=7592364;
Binnie C., Butler M.J., Aphale J.S.,
        Kinashi H., Hopwood D.A.; "A set of ordered cosmids and a detailed genetic and physical map the 8 Mb Streptomyces coelicolor A3(2) chromosome."; Mol. Microbiol. 21:77-96(1996).
                                                                                                                                          SPECIES=S.coelicolor; STRAIN=A3(2); Bentley S.D., Parkhill J., Barrell B.G., Rajandream Submitted (MAR-1999) to the EMBL/GenBank/DDBJ databa
                                                                                                                                                                                                                              SEQUENCE FROM N.A.
SPECIES=S.coelicolor; STRAIN=A3(2);
Seeger K.J., Harris D.;
                                                                                                                                                                                                                                                                                   *Rrygsman P., Liao L., Walczyk E., Malek L.T.;
*ISolation and characterization of two genes encoding proteases
associated with the mycellum of Streptomyces lividans 66.";
J. Bacteriol. 177:6033-6040(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomyces lividans, and Streptomyces Bacteria; Firmicutes; Actinobacteria; Av
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-NOV-1996 (TrEMBLrel.
01-NOV-1996 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q54398;
01-NOV-1996
EMBL; L42758; AAA93056.1;
                                                                                                  SPECIES=S.coelicolor;
                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                 Submitted
                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SLPD OR SCH5.02C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROTEINASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q54398
                                                                                   MEDLINE=97000351; PubMed=8843436;
                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces.
NCBI_TaxID=1916, 1902;
                                                                      Redenbach M., Kieser H.M., Denapaite
                                                                                                                                                                                                                 (MAR-1999) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                  STRAIN=A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01,
01,
15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                     Ð.,
                                                                                                                                                                                                                                                                                                                                         Bourgault R., DiZonno M.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             539
                                                                                                                                                                                                                                                                                                                                                                                                                                              Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            coelicolor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AA
                                                                      Eichner A.,
                                                                                                                                             databases.
                                                                        Cullum
                                                                      ٦
,
                                            for
```

069580 030766 053945 P70745 050399

9 mycobacteri 0 mycobacteri 6 streptomyce

Q9RL54

18;

```
TRESULT OF ACCORD OF ACCOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SORRAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                       Q54399;
Q54399;
Q1-NOV-1996
Q1-NOV-1996
Q1-OCT-2000
                                                                                                                                                                        SLPE.
Streptomyces lividans.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Firmicutes; Streptomycineae; Streptomycetaceae; St
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; AI MEROPS;
                            MEDLINE=96042075; PubMed=7592364;
Binnle C., Butler M.G., Aphale J.S.,
Krygsman P., Liao L., Walczyk E., Mal
"Isolation and characterization of tw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO; IPRO00073; -.
INTERPRO; IPRO00379; -.
PFAM; PF00561; abhydrolase;
SEQUENCE 539 AA; 57033 M
                                                                                                                                                                                                                                                                                                    PROTEINASE
                                                                                                                                              SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             •
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TSLRCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DGKRCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VVGTTRDPATPYRWAEALSDQLTSGHLLTYEGDGHTAYGRGSSCIDSAINTYLLTGTAPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VVSTTHDPATPYQSGVDLARQL-GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAFSSPDE-VRDALPDFEKASPVFGE--GLAWSSLNCAYWPVKPTGEPHRIEAAGATPIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAWVAADQRIRQVAPFLS----YGQFTGSAPRDL-CALWPVPATSTPHPAAPAGAGKVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EGAWQQLRESITSAIKEKDGAGLLILSDSYYEREADGGYSNLMFANAAVNCLDL-----P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CVKQPDCPLGDKDTTPDQVGKNLKSFFDDLDAKPLPAGDADGRKLTESLATTGVIAAMYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARSPACPLG---TDSAQWVNRYHALVDPLVQK--PGKTSDPRGLSYADATTGTINALYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LTYVGASYGTFLGATYAGLFPDRTGRLVLDGAMDPSLPARRLNLEQTEGFETAFQSFAKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --TDVTPDDAGETDELVDAYKEFAEGCGADAP--KLLRHVSTVEAARDMDVLRAVLGDEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NPGGPGGSAIGYLQQYAGIGYPAKVRAQYDMVAVDPRGVARSEP-VECLDGREMDAYTR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NPGGPGASAVDMVAAMAPATADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLGWRDC-----GVPGFQCATMKAPLDYAKPADGDVRLAVARKKATGPGKRLGSLLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --SWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT--GQRFGALLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FRATLLTAALLATACSAGGASTSAGSPAAKAAGATEAATATLTP-LPKATPAELSPYYEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WRRRPLSSALLSFGLLLGGLLLA----APPLAGATEEPGAGQTPGAPVVAPQQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AL035636;
S; S33.006;
                                                                                                                                                                                                                                                                                                                       (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             518
                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAB38476.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          28.5%;
                                                                                                                                                                                                                                                                                                                         01,
01,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   e; 1.
MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          69;
                                                                                                                                                                                                                                                                                                                         Created)
Last sequence up
Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 780; DB z; Pred. No. 9e-49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3AC0689E01BA2C4A CRC64;
                                                 S., Bourgault R.,
Malek L.T.;
                                two
                                                                                                                                                                                                                                                                                                                                                                                                                     513
                              genes
                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                         update)
                              encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                          DiZonno
                                                                                                                                                                                                         Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    539;
                                                                          3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          19;
```

```
QQ QALOQUE ACCOUNTS OF ACCOUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RT DR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local :
                                                                                                                                                                                                                                                                           Q9L0Q0
Q9L0Q0;
Q9L0Q0;
Q9-COT-2000 (Tremblrel. 15, Created)
O1-OCT-2000 (Tremblrel. 15, Last sequence uproduction)
O1-OCT-2000 (Tremblrel. 15, Last annotation)
O1-OCT-2000 (Tremblrel. 15, Last annotation)
O1-OCT-2000 (Tremblrel.)
O-OCT-2000 (Tremblrel.)
O-OCT-2000 (Tremblrel.)
                                                                                                                                                                                                                              HYPOTHETICAL 56.8 KDA PROTEIN.
SCD8A.14C.
Streptomyces coelicolor.
Bacteria; Firmicutes; Actinobacteria; Actinobacterida
Actinomycetales; Streptomycineae; Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PFAM; PFO
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       associated with the mycellum of Streptomyces lividans J. Bacteriol. 177:6033-6040(1995). EMBL; L42759; AAA93057.1; -. MEROPS; S33.007; -:
                                                                                                                     STRAIN=A3(2);
Seeger K.J.,
                         STRAIN-A3(2);
                                                  SEQUENCE FROM
                                                                                               Submitted (MAR-2000)
                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO; IPR000379; -.
                                                                                                                                                                                                                  NCBI_TaxID=1902;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RRMADELGKDVGVVLTWQGEGHGAYGNGSDCVDSAVDAYLLKGTVPKDGKVCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VDLARQLG---APLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTELGGVYAHLFPEHVGRVILDAVVDPGADTMGHAENQARGFQRALDDYLESTGQEP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GVTHVEQVYRQLAQD----CVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEIRTA----RCATVSVPVDYDQPGGTQAKLAVIRVPATG-QRFGALLVNPGGPGASAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LLLGGLLLAAPPLAGATEE------PGAGQTPGAPVVAPQQS--WNSCREFIADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAEEG-DGSELLALADGYNERDPSGRYGTTTHSQRVISCLDDKQRPTVEETKKLL---PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LGTDSAQWVNRYHALVDPLVQKPGKTSDP-RGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----EEQAYLKDAADFGRGCEKAAG-KLMEHVSTTDTARDMDLMRHVLGDERMHYFGISY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STM----PSYADTVSSLHERYDLVSWDPRGVA-ASEGVRCRTDEAIEAAESVDSTPDSPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DMVAAMAPAIADT--DILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LTAAAALLTAGCSGGSSDEDKDDGGRSSAGPSAAAPSGVPEALASQTLDWARC-----EG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----EQGSRKIAGLLERLDAEPLPTSSPGRELTQTLAFTGIVLPLYSESGWPALTSALK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SDDAPAPDGDWRCATLKAPLDWSDPDGETIDLALIRSRASGDDRIGSLLFNFGGPGASGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PF00561;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                        Harris
                                                  N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  · FGAFLGWDTAGWCHDWPVAGQHETAEVSAPDAAPVLVVGNTGDPATPYEGA
     Parkhill
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            abhydrolase; 1.
AA; 54224 MW;
                                                                                                                        D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                23.9%;
                                                                                               ç
ŗ,
                                                                                            the
     Barrell
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         69;
                                                                                               EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7A6F3FE83723B076
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        e 653.5; L. No. 1.3e-39;
     œ
                                                                                                                                                                                                                         Actinobacteridae;
Streptomyces
  Rajandream
                                                                                                                                                                                                                                                                                                                                                                                         update)
                                                                                                                                                                                                                                                                                                                                                              update)
                                                                                               databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             64
```

```
RESULT Q9ZBJ5
ID Q9ZBJ5
AC Q9ZBJ6
AC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RA RAT RATE OF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 193
                                                                                                                                                                   O92BJ5;
O1-MAY-1999 (TrEMBLrel. 10, Cr
O1-MAY-1999 (TrEMBLrel. 10, La
O1-JUN-2000 (TrEMBLrel. 14, La
PUTATIVE SECRETED PEPTIDASE.
Streptomyces coelicolor.
Bacteria; Firmicutes; Actinobacteria;
Actinomycetales; Streptomycineae; Stre
NCBI_TaxID=1902;
[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "A set of ordered cosmids and a detailed the 8 Mb Streptomyces coelicolor A3(2) che Mol. Microbiol 21:77-96(1996).
EMBL; AL160331; CAB77335.1;
                                                                                                                                                                                                                                                                                                                                                                               Q9ZBJ5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hypothetical protein. SEQUENCE 545 AA; 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Kinashi H., Hopwood D.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Redenbach M., Kieser H.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 σ
                                                                                                                                                                                                                                                                                                                                                                                                                                          4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AVDAYLLNGTLPKPGTVC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AVMHYFLDGTLPPTSLRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VSAP-GAPPVLLVGNTGDPATPYEGAARMARRLGEKVGVELTYEGEGHGAYDSGNTCVRN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPL --- ITFDGTQHTAVFDGNQCVDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   c-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CVYAPTPADPAA-WVAADQRIR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHY-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ALLVNPGGPGASAVDMVAAMAPAIADTDIIR-HFDLVGFDPRGVGHSTPALRCRTDAEFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VAPQQSWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATG---QRFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RPLSSA-LLSFGLLLGGLLLAAPP-----LAGATEEPGA-----GQTP---GAPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PALRVGLEA - - AADDDGDVL - - - - - HDLAEALGQHGTGGGTDDGTTDEESNEDDAFRAIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WCARQ-GCTLGEDAEDIVDLVVGLEAALDDTPLSTPDDGELDGDALVAAVTGALYRQDYW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EDEIDGIPDDGGDETDALVRFNRETAAACEKNSG-DALPYVGTTQAARDMDLMRQVLGDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SLLENFGGPGGSGVATLPGLA---ADYEKLRTRYDLVSFDPRGVGNSR-GVRCPDAGLPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PAPIQGGGEAPGALPDGT----PWQCATLRTPLDWKNPSGETMDLALVRARTSGTPDDRIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             {\tt RAISTAVLLSAATLLASSLTACAPTDRDGDRQGDTGGTTSDAQALNDLRAQSPHWRDCPA}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (MAR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -ADSSSRYTVADVLSRLPDFIEASPLFGPGLAWSTLS--
                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    56801 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Denapaite
                                                                                                                                                                                                                                            Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 648.5;
Pred. No. 3.3e
54; Mismatches
                                                                                                                                                                                                                                                                       Last
                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2E70670C3FF7BEEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -QVAPFLSYGQFTGSAPRDLCALWPVP-ATSTPH
                                                                                                                                                                                                                                                                       sequence update)
                                                                                                                                                                                                                                            annotation
                                                                 Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D.,
                                                                                                                                                                                                                                                                                                                                                                               529
                                                                                                        Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .3e-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    genetic
                                                                                                                                                                                                                                                                                                                                                                            ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eichner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     228;
                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ا
د.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -CDGWPVPGAARHPE
                                                              Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 physical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cullum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -SNDQDAFNAVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     21;
```

```
RESULT Q544410 Q5 AC Q5 DT 01 DT 01 DT 01
                                                                                                           밁
                                                                                                                              ρy
                                                                                                                                                         밁
                                                                                                                                                                             ρ
                                                                                                                                                                                                        멍
                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                     DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 170
Q54410;
Q54410;
01-NOV-1996
01-NOV-1996
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "A set of ordered cosmids and a detailed genetic at the 8 Mb Streptomyces coelicolor A3(2) chromosome. Mol. Microbiol. 21:77-96(1996).

EMBL; AL035161; CAA22727.1; -.
INTERPRO; IPR000073; -.
INTERPRO; IPR0000379; -.
IPAM; EPO0561; abhydrolase; 1.

EFAM; EPO0561; abhydrolase; 1.

EFAM; EPO0561; abhydrolase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Seeger K.J., Harris I
Submitted (JAN-1999)
[2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=A3(2);
MEDLINE=97000351;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=A3(2);
Bentley S.D., Parkhill
Submitted (JAN-1999) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "A set of ordered cosmids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM STRAIN-A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Redenbach M.,
                                                                                                            442
                                                                                                                                   468
                                                                                                                                                                                                         328
                                                                                                                                                           386
                                                                                                                                                                                 408
                                                                                                                                                                                                                               348
                                                                                                                                                                                                                                                         279
                                                                                                                                                                                                                                                                               295
                                                                                                                                                                                                                                                                                                       223
                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                     163
                                                                                                                                                                                                                                                                                                                                                                             183
                                                                                                                                                                                                                                                                                                                                                                                                     113
                                                                                                                                                                                                                                                                                                                                                                                                                            123
                                                                                                                                                                                                                                                                                                                                                                                                                                                    53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7
                                                                                                           GVAAHRLLRDSALVVEEGGGNHGITLSGNDCLDEHLAAYLTDGTVP
                                                                                                                                                                                                                                                                     TDSAQWVNRYHALVDPLVQKP--GKTSDPRGLSYADATTGTINALYSP----
                                                                                                                                                                                                                                                                                                                                                                  GVDLARQL--GAPLITEDGTQHTAVEDGNQCVDSAVMHYFLDGTLP
                                                                                                                                                        DLYEKAPFMVWNNAWYNAP----CAFWPT-GSGQPVDVANGELPPVLLFQATGDAATPYEG
                                                                                                                                                                                RIROVAPELSYGOFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVVSTTHDPATPYQS
                                                                                                                                                                                                         EAFASYAKDEDTGPLVEAYENFGALDASG
                                                                                                                                                                                                                                                                                                      YAKLHPDRVRRLVLDSVVGPDDVWYDANLNQ....DLAFNDRHRAFLAWIAEHDAAYGLG
                                                                                                                                                                                                                                                                                                                             YLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFND----YAADCARSPACPLG
                                                                                                                                                                                                                                                                                                                                                     QANLARAESFADACGEKYADVLPYIDTVDAARDVDAIRAALGAEKLNYFGYSYGTYLGAV
                                                                                                                                                                                                                                                                                                                                                                                                     SSLPA---
                                                                                                                                                                                                                                                                                                                                                                                                                           AMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVE 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                   YPTLQCASLEVPLDHARPRGRRITLALSRVPHTAGTYQGPLLVNPGGPGGSGLTLAGFVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                               IRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT-GQREGALLVNPGGPGASAVDM----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RQRAAVLCGAAVIAAGTVTAVP--ADASAPRPAHPAPVAP--AAGLHWEKCA-----TED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSE
                                                                                                                                                                                                                             SGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQ
                                                                                                                                                                                                                                                      SDPERVEAAWYAMRTALAKRPAGGKV----GASELEDT----YMPGGYYNGYWPYLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   170;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N.A.
                                                                                                                                                                                                                                                                                                                                                                                                     -RVAAQYDVIGFDPRGVGRSTPALDC-LPGHFDPVRPDSLPD----TPDVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Kieser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PubMed=8843436;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   H.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Barrell B.G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Denapaite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Barrell B.G., Rajandream M.A
EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 583.5; DB 2
Pred. No. 1.6e-34;
                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                        --DNGYSVYTAVQCRDAAWPRDWDEWRDDSW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D.,
                                                A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Eichner A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  229;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
e.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                   511
                                                                                                           487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cullum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            physical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Α.;
                                                                                                                                                                                                                                                                              -QRWKYLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -VA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                 467
                                                                                                                                                                                                                               407
                                                                                                                                                                                                                                                                              347
                                                                                                                                                                                                                                                                                                                                                     222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          66
                                                                                                                                                                                                         385
                                                                                                                                                                                                                                                      327
                                                                                                                                                                                                                                                                                                      278
                                                                                                                                                                                                                                                                                                                             294
                                                                                                                                                                                                                                                                                                                                                                                                     162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19;
```

(TrEMBLrel. (TrEMBLrel. (TrEMBLrel.

01, 01, 15,

Created)

Last sequence update)
Last annotation update)

```
RESULT
069831
                                                                                                                                             밁
                                                                                                                                                                     Q
                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                         ρ
                                                                                                             Qy
                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
∮₽
                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             So
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                069831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PFAM; PF00561; abhydrolase; 1.
PROSITE; PS00120; LIPASE_SER;
Signal; Aminopeptidase.
SIGNAL 1 39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Butler M.J., Binnie C., DiZonno M.A., Krygsman P. Soostneyer G., Walczyk E., Malek L.T., "Cloning and characterization of a gene encoding tripeptidyl aminopeptidase from Streptomyces livi Appl. Environ. Microbiol. 61:3145-3150(1995). EMBL, L27466, AAA92338.1; -. EMBL, L27466, AAA92338.1; -. MEROPS; S33.002; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces
NCBI_TaxID=1916;
[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A. MEDLINE=96090168; PubMed=7487044;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO; IPRO00734;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Streptomyces lividans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TRIPEPTIDYLAMINOPEPTIDASE
                                                                                       515
                                                                                                                                              455
                                                                                                                                                                           445
                                                                                                                                                                                                         398
                                                                                                                                                                                                                                    385
                                                                                                                                                                                                                                                                 354
                                                                                                                                                                                                                                                                                            329
                                                                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                                                                                                                                                                             220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      161
                                                                                                                                                                                                                                                                                                                                                                                  234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           տ
                                           6
                                                                                       TYLLTGRTDARDVTCAP
                                                                                                                HYFLDGTLPPTSLRCAP 519
                                                                                                                                                                                                                                                                                                                                                                                               LGDDQINYLGYSYGTKLGTAYLERFGTHYRAMYLDGAIDPAYSPI--EESISQMAGFQTA
                                                                                                                                             TGKGLPPVLIVQSERDAATPYEGAVELHQRFRGSRLITERDAGSHGVTGLVNPCINDRVD
                                                                                                                                                                        APAGAGKVVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM
                                                                                                                                                                                                      YTAVECTDAKWPANWRTWDRDNTRLHRDHPFMTWANAWMNLP----CATWPVKQQTPLNVK
                                                                                                                                                                                                                                 FNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPA 444
                                                                                                                                                                                                                                                               SAWAPTAEIFS----KYV------AGDTQALVDAAAPDLSDTAGNASAENGNAV
                                                                                                                                                                                                                                                                                          ATTGTINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDY--DGRDADGHYS--NDQDA 384
                                                                                                                                                                                                                                                                                                                        WKDWQDWVAANDAAYHLGDTRAEVQDQWLKLRAAAAKKPLGGVVGPAEL1SFFQSAPYYD
                                                                                                                                                                                                                                                                                                                                                   FNDYAA-DCARSPACPLGTDSAQWVNRYHALVDPLVQKP-GKTSDPRGL-----SYAD
                                                                                                                                                                                                                                                                                                                                                                                LGEKKLNYLGVSYGTYLGAVYGTLFPDHVRRMVVDSVVNPSRDKIWYQANLDQDVAFEGR 293
                                                                                                                                                                                                                                                                                                                                                                                                                                         EFVKAPKADPVPG-SEADKRAQRKLAREYAEGCFERSG-EMLPHMTTPNTARDLDVIRAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                        EF-DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RQGALIYNPGGPGGSGLRFPARVTNKSAVWANTAKAYDFVGFDPRGVGHSAP-ISCVDPQ 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REGALLVNPGGPGASAVDMVAAMAPAIAD-TDILRHEDLVGFDPRGVGHSTPALRCRTDA 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ARAARAGIDWEDC---AADWNLPKPIQCGYVTVPMDYAKPYGKQIRLAVDRIGNTGTRSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RKSSIRRRATAFG--TAGALVTATLIAGAVSAPAASAAPADGHGHGRSWDREARGAAIAA 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTP------GAPVVA 49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    40
537 -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IPR000073;
                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ΑA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               537 TW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20.8%;
                                                                                     531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 570.5;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TRIPEPTIDYLAMINOPEPTIDASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          POTENTIAL.
               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      UNKNOWN_1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               850703374BC4DEC9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ed. No. 1.5e-33;
Mismatches 233;
               543
               A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ding a sec
lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         secreted
ans 66.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Soltes G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  101
                                                                                                                                                                                                                                                                                                                                                                                                             277
                                                                                                                                                                                                      454
                                                                                                                                                                                                                                                                                                                                                                                                                                        233
                                                                                                                                                                                                                                                                                                                        353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21;
```

```
δÃ
                                                                          g
                                                                                                 Q
                                                                                                                           В
                                                                                                                                                   δõ
                                                                                                                                                                              밁
                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      O69831;
O1-AUG-1998 (TrEMBLrel. 07, 01-AUG-1998 (TrEMBLrel. 07, 101-MAY-2000 (TrEMBLrel. 13, 19UTATIVE SECRETED PROTEASE. SC1B5.03C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Protease.
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the 8 Mb Streptomyces coelicolor A3(2) Mol. Microbiol. 21:77-96(1996). EMBL; AL023517; CAA18977.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomyces coelicolor.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Redenbach M., Kieser H.M., Denapaite D., Kinashi H., Hopwood D.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Parkhill J., Barrell Submitted (MAY-1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=A3(2);
Parkhill J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Actinomycetales; Streptomycineae; NCBI_TaxID=1902;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PFAM; PF00561; abhydrolase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "A set of ordered cosmids and a detailed genetic at the 8 Mb Streptomyces coelicolor A3(2) chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=97000351; PubMed=8843436;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Harris D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
 445
                        401
                                                 391
                                                                          350
                                                                                                   333
                                                                                                                            290
                                                                                                                                                    275
                                                                                                                                                                              230
                                                                                                                                                                                                                                183
                                                                                                                                                                                                                                                         163
                                                                                                                                                                                                                                                                               126
                                                                                                                                                                                                                                                                                                          110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INTERPRO;
                                                                                                                                                                                                      217
                                                                                                                                                                                                                                                                                                                                 73
                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                   13
                                                                                                                                                                                                                                                                                                                                                                                                           10
                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                         APAGAGKVVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM
                        NDAPWPADFEVWDRDNTRLARRAPFETWDNVWTNLP---CAYWQGPRQRPLDVRTAPGEL
                                                                                                  TINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADG--HYSNDQDAFNAVRC
                                                                                                                                                                             RAALGERRLTFMGASYGTYLGALYAELFPSHVRRMVFDAVVNPDPEQVWYRNNLDQSEAF
                                                                                                                                                                                                                             APTRPSDAYKKERAAE-----AEAY---ARDCAKR-GGEALRHYHSLNNARDLEVV
                                                                                                                                                                                                                                                                               PGGPGASGLYEPLVGMVPEW--KRIAAAYDLVGYAPRGVAPSAP-LSCQDPGDFFKGPRP
                                                                                                                                                                                                                                                                                              PGGPGASAVDM-VAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEF------
                                                                                                                                                                                                                                                                                                                                 PD-----GIRCGTVTVPLDYAHPDGKQVRLTVSRVRATHRDPDGGGREVPGQ--GALLYN
                                                                                                                                                                                                                                                                                                                                                         ADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT------GQRFGALLVN
                                                                                                                                                                                                                                                                                                                                                                                  AAALYSAAGSLLLATLTAAPVRAAPPAGPGPAEALGTAVAARRAAAAGVDFGRCPQAEEL
                                                                                                                                                                                                                                                                                                                                                                                                         SSALLS-FGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQS-----WNSC--REFI
                                                VYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALW-----
                                                                          YYDD-YWPHRAEALSAYL-----
                                                                                                                            EDRWDDFKEWVAEHDAVYGLGDTARQVQDSYEEASARLAAEPAGGTVGPAQFQGAFLTAG
                                                                                                                                                                                                  RQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPI--EESISQMAGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (MAY-1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IPR000073;
                                                                                                                                                                                                                                                     DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              543 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Taylor
                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ..
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               58514 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                              20.0%;
32.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B.G., F
to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ť
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rajandream M.A.;
e EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                            Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Last annotation update;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL/GenBank/DDBJ
                                                                         KGDPQPLVDQAGTRTAEGAVRSENSNAVYTAVEC
                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2D3E3E568E61A8B8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                              No. 7e-32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eichner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          update]
                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                    221;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Α.,
                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   physical map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Cullum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Streptomyces
                                                -PVPATSTPHPA
                                                                                                                                                                                                                                                                                                                                                                                                                                    87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             J.
                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                     332
                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                 125
                                                                                                                                                                                                                                                                                                                                                          109
                                                 444
                                                                          400
                                                                                                   390
                                                                                                                           349
                                                                                                                                                                              289
                                                                                                                                                                                                      274
                                                                                                                                                                                                                                                        216
                                                                                                                                                                                                                                                                                                          162
                                                                                                                                                                                                                                                                                                                                                                                   72
                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                               229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                                                                                                                                                    24;
```

```
RESULT
Q9X7U3
                    Qy
                                              В
                                                                   γQ
                                                                                                В
                                                                                                                   Ş
                                                                                                                                               Ъ
                                                                                                                                                                     Qy
                                                                                                                                                                                                Db
                                                                                                                                                                                                                   ρy
                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ър
                                                                                                                                                                                                                                               Query Match
Best Local s
Matches 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            James K.D.,
Submitted (M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-A3(2);
Oliver K., Harris D.;
"A set of ordered cosmids and a detailed genetic and ph.
the 8 Mb Streptomyces coelicolor A3(2) chromosome.";
Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                   Redenbach M., Kieser H.M., Denapaite D., Eichner / Kinashi H., Hopwood D.A.;
"A set of ordered cosmids and a detailed genetic athe 8 Mb Streptomyces coelicolor A3(2) chromosome Mol. Microbiol. 21:77-96(1996).
EMBL; AL049863; CAB42961.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-NOV-1999 (TrEMBLrel.
01-JUN-2000 (TrEMBLrel.
PUTATIVE PROTEASE.
                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=1902;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Firmicutes; Actinobactes
Actinomycetales; Streptomycineae;
                                                                                                                                                                                                                                                                                                                                  PFAM; PF00561; abhydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=A3(2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SC5H1.36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q9X7U3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q9X7U3
                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=97000351; PubMed=8843436;
                                                176
 233
                         239
                                                                                                                                                                                                                                                                                                                                                            NTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            503
                                                                                                125
                                                                                                                        125
                                                                                                                                                                                                                                                                                                                                               NTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   458
                                                                                                                                                65
                                                                                                                                                                      65
                                                                                                                                                                                              12
                                                                                                                                                                                                                       σ
VYAARFPDKVGRMVLDG-VDTLTEPLAEQGLAGARGQQTALENFLDWCVEDVACPFGQDA
              AYLERFGTHVRAMVLDGAIDPAVSPI-EESISQMAGFQTAFNDYAADCARSPACPLGTDS
                                                                      THVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGT
                                                                                                GKEF -- MHLTNGYDVVTFDPRGVGRSSPVSCGPATLKIMEATDGDGGMTDPEG------
                                                                                                                     APATADTDTLRHFDLVGFDPRGVGHSTP-----ALRCRTDAEFDAYRRDPMADYSPAGV 178
                                                                                                                                              EMPKDLQCGKVTVPLDYSRPRGGTLDVALARYRATGDSRGSVLLNFGGPGGSGINELALG
                                                                                                                                                              SEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAM 124
                                                                                                                                                                                              RRCAVTGALGLALLGAGLPAAASGATTATTRDTGSGL---SRFYDQRVEWTACE----GT
                                                                                                                                                                                                                RRPLSSALLSFGLLLGGLLLAAPPLAGA-TEEPGAGQTPGAPVVAPQQSWNSCREFIADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AYLLDGRLPARDTSCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PP----TLVLAAERDAATPYEGALELRRRLAGSVLVTERDAGTHGIAGGPNACVNGHLE
                                               --VLERLRDAAAECAKYSG-PVLPHIGTVDAARDMDVMRRALGDDRLNYLGFSYGTRLGA
                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (MAY-1999)
                                                                                                                                                                                                                                                                                                                                               IPR000379; -
                                                                                                                                                                                                                                                                                                                                                         IPR000073;
                                                                                                                                                                                                                                                                                                          543 AA;
                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 coelicolor.
rmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N.A.
                                                                                                                                                                                                                                                                                                           57696 MW;
                                                                                                                                                                                                                                                         19.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             to,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12,
12,
14,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Barrell B.G., Rajandream M.A.;
the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                               76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Created)
                                                                                                                                                                                                                                                          Score 529; DB 2;
Pred. No. 1.5e-30;
                                                                                                                                                                                                                                                                                                           D4E6549032B9F4B6
                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                           CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                 and
e.";
                                                                                                                                                                                                                                                                                                                                                                                                                                 Α.,
                                                                                                                                                                                                                                               Indels 100;
                                                                                                                                                                                                                                                                                                                                                                                                                                 Cullum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               physical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Streptomyces.
                                                                                                                                                                                                                                                                                                                                                                                                         physical
                                                                                                                                                                                                                                                                       543;
                                                                                                                                                                                                                                                                                                                                                                                                          map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                map
                                                                                                                                                                                                                                            Gaps
                                               232
                                                                                                                                                                                              64
                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   512
291
                       297
                                                                                                                                              124
                                                                                                                                                                                                                                               19;
```

```
망
                      ρy
                                                DЬ
                                                                      QΥ
                                                                                                В
                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM STRAIN=A3(2); Cerdeno A.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SCC121.19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomyces coelicolor.

Bacteria; Firmicutes; Actinobacteria; Actinobacterida Actinomycetales; Streptomycineae; Streptomycetaceae;
                                                                                                                                                                                                             Kinashi H., Hopwood D.A.;

"A set of ordered cosmids and a detailed genetic a the 8 Mb Streptomyces coelicolor A3(2) chromosome. Mol. Microbiol. 21:77-96(1996).

EMBL; AL137166; CAB69737.1; -
SEQUENCE 499 AA; 53138 MW; 4553D0B88093E753 CF
                                                                                                                                                                                                                                                                                 STRAIN=A3(2);
Redenbach M., Kieser H.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, PUTATIVE SECRETED PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9L2G7;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                        Submitted
                                                                                                                                                                                                                                                                                                                                                                                                       Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                   Oliver K.,
                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN-A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9L2G7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=1902;
111
                        123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          298
                                                                        65
                                                55
                                                                                                σ
                                                                                                                         σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YASSKCVHRKVDDFLLYGSLPPDGSSCGP
GKGQKLPQEVRDT-----HDLIGFAPRGLAPSTPA-DCGLEYGDLATSRLRPWPAPDGSV
                      A----MAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRT---DAEFDAYRRDPMADYSP 175
                                                                                           RSRSIRNAAI-VGVSTALLGVTAPVTASA----AGGSTTDA-----LTWSACEGTGLDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLITFD--GTQHTAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTI-----NALYSPQRWKYL-----
                                                             SEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPA--TGQRFGALLVNPGGPGASAVDMVA 122
                                                                                                                        RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FDGNQCVDSAVMHYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DDPDRPTAAQVTASLDRLRARYEDVSPVFGRYRLTQVLMCYGRPRGTDYIRDDVKDL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QLLEDGDTRGLEGFSSGGVTFPVRAAVNAPVRGDRTAGLTDEEDVPMDNLPAALMAINCA
                                                                                                                                                  146;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YAPTPADPAAWVAADQRIR----QVAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RDARDQVERLVASL-----DSDPVPSAFGEPFTGQDMVGAIGQALYSRELWPSLERALA
                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                        (JAN-2000)
                                                                                                                                                                                                                                                                                                                                                                                                     , Harris D.; (JAN-2000)
                                               ECATLDVPMDYADPDGPRIEMAVSRIPAEKPDARRGALLLIAGGPGGSSLNDPS 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -TSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQD-----
                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                      , Parkhill J., Ba
                                                                                                                                                                                                                                                                                                                 N.A.
                                                                                                                                                                                                                                                                                                                                                                              N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -DTARMLLVGTRGDPATPYRWTTETADRLGPSAVVLDNRGEGHTG-
                                                                                                                                                           13.8%;
27.2%;
                                                                                                                                                                                                                                                                                                                                                                                                     ç
                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                                                  78;
                                                                                                                                                                                                                                                                                       Denapaite D.,
                                                                                                                                                                                                                                                                                                                                        Barrell B.G., Rajandream M.A
EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                      EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                              Score 379; DB 2;
Pred. No. 1.1e-19;
8; Mismatches 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Actinobacteridae;
                                                                                                                                                                                                                                                                                        Eichner A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FLSYGQFTGS----APRDLCAL
                                                                                                                                                  245;
                                                                                                                                                                                                                                                                                                                                                                                                     databases
                                                                                                                                                                                                                CRC64;
                                                                                                                                                                       Length
                                                                                                                                                                                                                                                      and
e.";
                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                        Cullum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptomyces
                                                                                                                                                                                                                                                              physical
                                                                                                                                                                                                                                                                                                                                                     Α.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -AFNAVRCV 391
                                                                                                                                                 68;
                                                                                                                                                                                                                                                               qem
                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       432
                                                                                               54
                                                                                                                         64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              462
                                                                                                                                                 22;
```

```
Ş
                                                                                                                         В
                                                                                                                                                      γ
                                                                                                                                                                                      В
                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
P71969
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                         Вþ
                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
ſ
                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-JAN-1998 (TYEMBLIEL 05, Created)
01-JAN-1998 (TYEMBLIEL 05, Last sequence update)
01-JUN-2000 (TYEMBLIEL 14, Last annotation update)
HYPOTHETICAL 54.0 KDA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Skelton J., Churcher C.M., B submitted (SEP-1996) to the EMBL; Z80225; CAB02326.1; TUBERCULIST; Rv2672; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-H37RV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P71969;
                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                       Hypothetical protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=1773;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RV2672 OR MTCY441.41
                                                           181
                                                                                                                           126
                                                                                                                                                         100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            165
                                                                                                                                                                                         99
                                                                                                                                                                                                                        49
                                                                                                                                                                                                                                                        9
                         MDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMA
                                                                                                                                            GQRFGALLVNPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PLAGALRMREALGRRAVMVTVDSTGHDSYLANGNACGDATVSRFLATGQRPGSDVYC
           ::
                                                           ---DHFDRDEMRDQAQFQAGDDPVANLSDISNTATTDCTDAIAPGESAYDNTHAAS----D
                                                                                         AEFDAYRRDPMADYS--PAG---VTHVEQVYRQLAQDCVDRM--GFSFLANIGTASVARD
                                                                                                                         PSDAGPLVFTTGSDLPSSTQLPVWLAH - - AGIDVLRSHPIVAVDRRGMGMSSP - IDCR - -
                                                                                                                                                                                         APKNDLSWHDCTSRVYSNAGIPAAPGVKLECASYDTDLDPLVGGSTAVSIGVVRARSNQT
                                                                                                                                                                                                                      APQQ--SWNSCREFIADTSEIRTA----RCATVSVPVDYDQPGGTQAKLAVIRVPA--T
                                                                                                                                                                                                                                                        RPMTSTAMLVALTCSATVLAACVPAFGADPRFATYSGAGPQGAATTTPPPPAGP---PPLA 65
                                                                                                                                                                                                                                                                                        RPLSSALLSFGLLLGGLLLAA--------PPLAGATEEPGAGQTPGAPVV 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PYQSGVDLARQLG--APLITEDGTQHTA-VEDGNQCVDSAVMHYFLDGTLPPTSLRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGYEKDVAESRAKYPLTAGMPRNAMLCAAWPYPPREAPVRITDRGPSNVLLVQNERDVNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DQRIRQVAPFLSYGQFTGSAPRD--LCALWPVPATSTPHPAAPAGAGKVVVVVSTTHDPAT 463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AR----LMRAAAEGTV------PPAPQAPPEAVLQNVAAVGAGVLCNDVAWPKGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAW-VAA 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RLADRAADVRPLFLRLAARLDREPI - - - PWPGANPEELNGNVLRQTMLDSFAAPGRYPTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ~~~~LGTDSAQWVNRYHALVD~~PLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LGTAYLERFGTHVRAMVLDGAIDPAVSPIEES--ISQMAGFQTAFNDYAADCARSPACP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DGNM---TTARRMADACA-RNGRELIKHLSTANEARDIDRLRAALGERRISAWGVSYGTY 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTK 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VGSVYAQLFPHRTDRILLDSVDNPDPALVNRAWLAAHERGVEDTFPHFAA-WASKPGNPD
                                                                                                                                                                                                                                                                                                                                                                                                                                 PF00561; abhydrolase; 1.
                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                     IPR000073; -
                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                        AA;
                                                                                                                                                                                                                                                                                                                                                                                                        54015 MW;
                                                                                                                                                                                                                                                                                                                                      10.9%;
25.1%;
           =
::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Barrell B.G., Rajandream M.A
e EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                  Score 298.5; DB 2;
Pred. No. 8.2e-14;
                                                                                                                                                                                                                                                                                                                                                                                                        64FF0A1A97C16868 CRC64;
                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ą
                                                                                                                                                                                                                                                                                                                        250;
                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                M. A. ;
                                                                                                                                                                                                                                                                                                                                                        528;
                                                                                                                                                                                                                                                                                                                        101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    498
                                                                                                                                                                                         125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 441
                                                                                                                                                                                                                         99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            346
                            272
                                                           234
                                                                                         212
                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            292
                                                                                                                                                                                                                                                                                                                        26;
```

```
RESULT OF BEAUTIFE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                    Q9PB15;
01-OCT-2000
01-OCT-2000
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Simpson A.J.G., Reinach F.C., Arruda P., Abreu F.A., Acencio M., Alves L.M.C., Araya J.E., Baia G.S., Baptista C.S., Barvarenga R., Alves L.M.C., Araya J.E., Baia G.S., Baptista C.S., Barvaros M.H., Bonaccorsi E.D., Bordin S., Bove J.M., Briones M.R.S., Bueno M.R.P., Camargo A.A., Camargo L.E.A., Carraro D.M., Carrer H. Colauto N.B., Colombo C., Costa F.F., Costa M.C.R., Costa-Neto C.M. Coutinho L.L., Cristofani M., Dias-Neto E., Docena C., El-Dorry H. Facincani A.P., Ferreira A.J.S., Ferreira V.C.A., Ferro J.A.,
                                                                                                   "The genome sequence of the plant pathogen Xylella Nature 406:151-157(2000).
EMBL; AE004043; AAF85129.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9PB15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=20365717; PubMed=10910347;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Xylella fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROTEINASE
                                                                              INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=2371;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        xylella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GFQTAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YSSCAVPPLVAYLDTGKLPDTDTYC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLITFDGTQHTAVFDG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VN-----RPTP------DRVRELVVAWGKLYPQFGAVAALNLVKCVHW--PSSSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FNAVRCVYAPTPADPAAWVAADQRIRQ--VAPFLSYGQFTGSAPRDL--CALWPVPATST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VATALGFPDSGRVDSTTKLADALAAARSGDMNLLSALINRAD--TTRDTDGQFISSCSDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TINALYSPQRWKY-LTSGLLGLQRGSDAGDLLVL-----ADDYDGRDADGHY·SNDQDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GQQAALDAFAAQCV-AVNCALGSHP-----KGAVSALLSAARSGDGPGGASVAAVANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -NQCVDSAVMHYFLDGTLPPTSLRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PQPPKDLKV-DVLLLGVQNDPIV----GNEGVAATAATAINANAASKRVMWQGIGHGASI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IERLRKLWDVPALAFVGTGNGTQVALAYAASRPDNVARLILDSPIALGVSAEAAAEQQVQ
1PR00073; -. ; IPR000734; -. ; IPR000734; -. ; IPR000734; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15,
15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gamma subdivision; Xanthomonas group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .
₹ ±
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               493
```

1

27

```
RESULT
OCCORD
OC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   νQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DR DR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 9.9
Best Local Similarity 25.3
Matches 140; Conservative
SEQUENCE FROM N.A.
Parkhill J., Barrell E
Submitted (JUN-1997) t
[3]
                                                                                                                                                                                                                                                                                                                  005685;
01-JUL-1997 (TrEMBLrel. 04, Creat
01-JUL-1997 (TrEMBLrel. 04, Last
01-NOV-1998 (TrEMBLrel. 08, Last
HYPOTHETICAL 54.2 KDA PROTEIN.
                                                                                                                                                                                                        Mycobacterium leprae.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae; MCBI_TaxID=1769;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PFAM; PF00561; abhydrolase; 1.
PRINTS; PR00793; PROAMNOPTASE.
PROSITE; PS00120; LIPASE_SER;
SEQUENCE 526 AA; 57463 MW;
                                                                                                                   Murphy L., Submitted
                                                                                                                                                                                                                                                                                                   MLC1351.24
                                                                                                                                                                                                                                                                                                                                                                                                                                             005685
                                                                                                                                                                 SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QCVDSAVMHYFLD 507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PHPAAPAGAGKVVVVSTTHDPATP-----YQSGVDLARQLGAPLITFDGTQHTAVFDGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VSLAFGLSYAPELIALLPLILNEAASGHYAPLMSLSQLVGLGMDDQMNHALQWAVICT--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LGLQRG-SDAGDLLVLADDYDGRDADGHYS-----:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FPI--DSRQQLR-----TLMERLRQGSE---VEYQDPASGEM----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTAYLERFGTHVRAMVLDGAIDPAVSPIEESI-SQMA-GFQTAFNDYAADCARSPAC---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TGVVAAVAPSL---NEVRKKRDIFFVDQRGTGGSHP-LTC-VDAQGRAFQLE-----AE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GHIRVL-CAQLPVLENPALPEGRRITLKIAWLERDSGSHPASDPVF----FIAGGPGQSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RMLKKYWIVLALVVGGVFVYFPTRVAASSFEASSAATLQPVVRSYGRLRFEPCILSARGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAP--QQSWNSCREFIADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   --- EDADRYVAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDL----CALWP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AQHYARRYRAHVRTLTMDGVV-----PNDLVIGSEFATTFENAIALQDAQCRKDPSCAKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NTTTPEQYIAFVQRCAASLQGRADPRYYTTTEAVTDLDMVRTALSVDKINLIGVSYGTRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VTHVEQVYRQLAQDCVDRM-GFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEIRTARCATVSVPVDYDQPGGTQAKLAVIRV-----PATGQRFGALLVNPGGPGASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -PLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -CV-SKLLGQFID
                                                                                                            FROM N.A.
, Harris D.;
| (MAY-1997) t
                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -LLLSGERDPVTPPHYAQKLLKGLRYGRHIVAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----ANAGAGGALFGSEVAQMFFTPCKVWPTGIRPPDFMMPLVSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9.5%;
                          to
                                                                                                                   б
         4.G.,
the
                                                                                                                   the
                        Rajandream M.A.;
> EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  76;
                                                                                                                                                                                                                                                                                                                                                                                                  Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 261; DB
Pred. No. 4.3e
76; Mismatches
                                                                                                                 EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 UNKNOWN_1.
02DA617B550E615F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                 sequence update) annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      261; DB 2;
No. 4.3e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                               525
                                                                                                                                                                                                                                                                                                                                                                                                                                             A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  217;
                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NDQDAFN----AVRCVYA
                          databases
                                                                                                                   databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels 120;
                                                                                                                                                                                                                                     Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -GQGHGTIRVG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -RRRRITADTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -VPATST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  30;
```

```
RESULT
Q9RD72
ID 9RD72
AC Q0
D7 00
D7 0
D7 0
D7 0
OS 5
COC 7
COC 7
RN
RN
RP
RP
                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                     .B
                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SO REP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 135; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.

MEDILINE=93188700; PubMed=8446027;
Eiglmeier K., Honore N., Woods S.A., C:
"Use of an ordered cosmid library to do
of Mycobacterium leprae.";
Mol. Microbiol. 7:197-206(1993).
EMBL; Z95117; CAB08271.1; -.
Hypothetical protein.
SEQUENCE 525 AA; 54245 MW; 8EB0849.
                                                                                                                            O9RD72
O9RD72;
O9RD72;
O1-MAY-2000 (TrEMBLrel. 1
O1-MAY-2000 (TrEMBLrel. 1
O1-JUN-2000 (TrEMBLRel. 1
 SEQUENCE FROM STRAIN=A3(2); Saunders D.C.,
                                                                             PUTATIVE PROLYL AMINOPEPTIDASE.
SCF43.16C.
Streptomyces coelicolor.
Bacteria; Firmicutes; Actinobac
                                                   Actinomycetales;
NCBI_TaxID=1902;
                                                                                                                                                                                                                                                   503
                                                                                                                                                                                                                                                                             497
                                                                                                                                                                                                                                                                                                      447
                                                                                                                                                                                                                                                                                                                                446
                                                                                                                                                                                                                                                                                                                                                         404
                                                                                                                                                                                                                                                                                                                                                                                  390
                                                                                                                                                                                                                                                                                                                                                                                                            347
                                                                                                                                                                                                                                                                                                                                                                                                                                      336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WRRRPLSSALLSFGLLLG---GLLL------AAPPLAGATEEPGAGQTPGAPVVAPQ
                                                                                                                                                                                                                                                                                                                                                                      CVYAPTPADPAAWVAADQRIRQ--VAPFLSYGQF--TGSAPRDLCALWPVPATSTPHPAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DAYRRDPMADYS--PAG---VTHVEQVYRQLAQDCVDRM--GFSFLANIGTASVARDMDM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FGALLVNPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEF
                                                                                                                                                                                                                                                    AVPPIIGYLTSGKLPATDTYC
                                                                                                                                                                                                                                                                           VDSAVMHYFLDGTLPPTSLRC
                                                                                                                                                                                                                                                                                                      PKNLKIDVMYLDVQNDPIVGFE-GVAATT---AAIINANAASKRVMWQGIGHGASIYSAC
                                                                                                                                                                                                                                                                                                                               PAGAG-KVVVVSTTHDPATPYQSGVDLARQLGAPLITFDGTQHTAVFDG--
                                                                                                                                                                                                                                                                                                                                                                                                         SLGFPSGDRVGTTMSLANALAAARSGDANPLTNLIHRSDATQDSDGQFVNDCSDALN---
                                                                                                                                                                                                                                                                                                                                                                                                                                  ALYSPORWKYLT----SGLLGLORGSDAGDLLVLADDYDG-RDADGHYSND-QDAFNAVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                             AALDTFAAQCV-ALKCALGPDP-----KSAVTALLAAAHAGKGPGGASVAAVTNAITV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TAFINDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LRNLWDVPALALIGIGNGAEVALAYAASRPDRVARLILDSPIALGIKTEAAAEQQVRGQQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DHYDRQKMRDQAQFESGDDPVANLSDISNTATTNCTDAITPGTSAYDNSHAAS---DIER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGPLVFTTGSDLPSSAQLPVWLSRSGA--DVVRTHPIVAVDRRGIGMSNP-IDCR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        {\tt KDLSWHDCTSRLFRDAGVAAAPGIQLECADYDSDLDPVNGGSGTVTIGAVRARSSQTPRD}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q--SWNSCREFIADTSEIRTA-----RCATVSVPVDYDQPGGTQAKLAVIRVPA--TGQR 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WHTRSATILVAVTALLVGCVPGLAANPRFATNSGARPQGAAATTTPAAGP----LLIAAPK
  .c.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
    Harris
                                                                  Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                         ----DRVRELVVAWGKLYPEFGTVGALNLVKCVHWPTGTT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9.5%;
24.1%;
                                                                                Actinobacter
  D.;
                                                                                                                              13, Created)
13, Last sequence up
14, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           72;
                                                                                                                                                                                                                                                                             517
                                                                                                                                                                                                                                                    523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
Pred.
                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8EB08491F65D4A7B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                             streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          No. 4.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Caudron B., Cole S.T.; deduce the genomic organization
                                                                                                                                                                                    433
                                                          Actinobacteridae;
Antomycetaceae; Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; DB 2
..7e-11;
                                                                                                                                                                                    AA
                                                                                                                                 on update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             261;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ν,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                               NOC
                                                                                                                                                                                                                                                                                                                                                         POP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           65
                                                                                                                                                                                                                                                                                                      502
                                                                                                                                                                                                                                                                                                                                496
                                                                                                                                                                                                                                                                                                                                                         446
                                                                                                                                                                                                                                                                                                                                                                                  445
                                                                                                                                                                                                                                                                                                                                                                                                           403
                                                                                                                                                                                                                                                                                                                                                                                                                                     389
                                                                                                                                                                                                                                                                                                                                                                                                                                                             346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     51
```

```
P89459
ID P89459
ID DT 0:
DT 0:
DT 0
DT V
GN U
GN U
GN U
GN U
GN U
                                                                                                                                                                                                                                                   ρy
                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                 멍
                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 105;
                                                                    P89459;
P89459;
01-MAY-1997
01-MAY-1997
01-JUN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO;
INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "A set of ordered cosmids and a c
the 8 Mb Streptomyces coelicolor
Mol. Microbiol. 21:77-96(1996).
EMBL; AL136502; CAB66205.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted [2]
          Alphaherpesvirinae;
                      Viruses; dsDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PFAM; PF00561; abhydrolase; 1. PRINTS; PR00793; PROAMNOPTASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=A3(2);
Redenbach M.,
                                Herpes simplex virus (type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Kinashi H., Hopwood D.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Thomson N.R.,
                                                                                                                                                                                 366
                                                                                                                                                                                                       435
                                                                                                                                                                                                                                306
                                                                                                                                                                                                                                                       409
                                                                                                                                                                                                                                                                                                                                                                              163
                                                                                                                                                                                                                                                                                                                                                                                                                                                     191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    133
                                                                                                                                                                                                                                                                                                                               212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                           LARGE TEGUMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SVPVDYDQPGGTQAKLAVIRVPAT----GQRFGALLVNPGGPGASAVDMVAAMAPAIADTD
                                                                                                                                                                                 ARLAANEVPAAAAVYHDDMYVDTAH
                                                                                                                                                                                                       VPATSTPHPAAPAGAGKVVVVSTTH
                                                                                                                                                                                                                               VRAEFPRFDAAKALAGDEPLLFTGESIHPWMFDCDPALRPLRETAELLAARTDWTPLYDP
                                                                                                                                                                                                                                                       IRQVAPFLSYGQ.
                                                                                                                                                                                                                                                                               LLEDAFVRTANGHELS - - DAFQEQAQGLLSYAGRPLYALVHEAIYGQDARPTDWSA - - ER
                                                                                                                                                                                                                                                                                                    LADDYDGRDADGHYSNDQDAFN-----AVRCVYA-----PTPADPAAWVAADQR
                                                                                                                                                                                                                                                                                                                               HLL----TRDVVLPNGYRL-----TVEAFQS------LGIMLGGGEGSHRLHF
                                                                                                                                                                                                                                                                                                                                                    PLVQKPGKTSD---PRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGSDAGD--LLV
                                                                                                                                                                                                                                                                                                                                                                              AALITGGL-PSLDAHADDVYR-AAYPRIERKVVAHYARYP--
                                                                                                                                                                                                                                                                                                                                                                                                   {\tt AMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQWVNRYHALVD}
                                                                                                                                                                                                                                                                                                                                                                                                                                                  DCVDRMGFSFLANIGTASVARDMDMVR-QALGDDQINYLGYSYGTKLGTAYLERFGTHVR 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ALKEYRVLLLDQRGTGASTPASR----QTLPLRGGPAEQADY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDP--MADYSPAGVTHVEQVYRQLAQ 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TVPLDHADPTGETIELYAREAVASDKADQDLPWLVYLQGGPGGKADRFVG--RPAWFGR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .R., Parkhill J., I (JAN-2000) to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IPR000379;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IPR000073;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (JAN-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IPR002410; -
                                                       7 (TrEMBLrel. 03, 07 (TrEMBLrel. 03, 07 (TrEMBLrel. 14, TEGUMENT PROTEIN.
                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Kieser H.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AA;
                      viruses,
                                                                                                                                                                                                                                                                                                                                                                                                                             LAHFRADAIVRDCEAIRPQVTGGAPWTVLGQSFGGFCTVAYLSLAPEGLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4.8%;
23.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     47580 MW;
          Simplexvirus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ţ
                      no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the
                                                                                                                                                                                                                                                       -FTG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           42; Mismatches

 RNA stage;

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Denapaite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Barrell B.G., Rajandream M.A
EMBL/GenBank/DDBJ databases
                                                                     Last sequence up
                                                                                             Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 131.5; DB Pred. No. 0.084;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a detailed genetic a
lor A3(2) chromosome
                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EF9DA0344C10EF55 CRC64;
                                                                                                                                                                                  390
                                                                                                                                                                                                        459
                                                                                                                     3122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .
.
                      Herpesviridae,
                                                                                                                     AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genetic and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eichner
                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           165;
                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               м.а.;
                                                                                                                                                                                                                                                                                                                                                                             --QDVERARRIAD
                                                                                                                                                                                                                                                       SAPRDLCALW-P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            physical map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cullum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           133;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                               305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            74
                                                                                                                                                                                                                               365
                                                                                                                                                                                                                                                       434
                                                                                                                                                                                                                                                                                                                              249
                                                                                                                                                                                                                                                                                                                                                      364
                                                                                                                                                                                                                                                                                                                                                                              211
                                                                                                                                                                                                                                                                                                                                                                                                     309
                                                                                                                                                                                                                                                                                                                                                                                                                             162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22;
```

```
밁
                                                                                                                                                     Q
                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ.
뭥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                           2410
                                                                                                                                                                                                                                                                                                                  2365
                                                                                                                                                                                                                                                                                                                                                                                                                       2335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (FEB-1997) to the EMBL; Z86099; CAB06722.1; -. SEQUENCE 3122 AA; 330047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=92356101; PubMed=1322965;
Barnett B.C., Dolan A., Telford E.A.R., Davison A.J
"A novel herpes simplex virus gene (UL49A) encodes
protein with counterparts in other herpesviruses.";
J. Gen. Virol. 73:2167-2171(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   McGeoch D.J., Cunningham C., McIntyre G., Dolan A.; "Comparative sequence analysis of the long repeat regions adjoining parts of the long unique regions in the genomes simplex viruses types 1 and 2."; J. Gen. Virol. 72:3057-3075(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Comparative DNA sequence analysis of the host shutoff genes different strains of herpes simplex virus: type 2 strain HG5: a truncated UL41 product.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE-87111457; PubMed-3027242; McGeoch D.J., Moss H.W., McMab D., Frame M.C.; Trame M.C.; The Moss H.W., McMab D., Frame M.C.; The Moss H.W., McMab D., Frame M.C.; The Moss H.W., McMab D., Frame M.C.; The Moss H.W., McGeoch D.J., Moss H.W., McGeoch D.J., Moss H.W., Frame M.C.; The McGeoch D.J., McGeoch D.J
                                                                                                       2470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Dolan A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=92113549; PubMed=1662697;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-HG52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a truncated UL41 product.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Everett R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=90278430; PubMed=2161906;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              comparisons.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-HG52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                               175
                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=10310;
[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 AAMWRRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gen. Virol. 71:1387-1390(1990).
                                                                                                                                                                                                                                                                                                                  VS-----SDIETWAVGLLHTDLNPIENACLAAQLPRLSA------LIAERPLADGP 24 09
                                                                                                                                                                                                                                                                                                                                                                VAAMAPAIADTDI-----LRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYS
                                                                                                                                                                                                                                                                                                                                                                                                                    AAATHRTP-AARVTAMDLVLAAVLL
                                              TAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLS---YADATTG
                                                                                                                                                                                                                                                         PA-----GVTHVEQVY-------RQLAQDCVDRMGFSFLANIGTASVARDMD--M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDM 120
                                                                                                                                                       VRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQ
                                                                                                                                                                                                           PCLVLVDISMTPVAVLWEAPEPPGPPDVRFVGSEATEELPFVATAGDVLAASAADADPFF
-PSAPTAARDPRDLAGGDGGSGPE-----DP-AAPPARQADPGVLAPTLLTDATTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Virol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Fenwick M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      68:19-38(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               330047 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 128;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6EBF94B51BFE8C0B CRC64;
                                                                                                       GRPFDASLLTGELFPGHPVYQRPLADEAG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Davison A.J., McGeoch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAPVVV-----ALRNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 3122;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                putative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HG52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              herpes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the short
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  encodes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                              2469
                                                                                                                                                                                                                                                                                                                                                                      174
                                                                                                                                                                                                                                                                                                                                                                                                                       2364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2334
                                                                                                                                                                                                                                                               215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
2552
                                                   332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25;
```

```
Q9RL54
ID Q
AC Q
DT 0
                     δÃ
                                              В
                                                                   QΥ
                                                                                            В
                                                                                                                QУ
                                                                                                                                                                                                   SQ DR DR
                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                         Query Match
Best Local Similarity
Matches 125; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                             Thomson N.R., Parkhill J., B
                                                                                                                                                                                                PROSITE; PS00137; SUBTILASE HIS; PROSITE; PS00138; SUBTILASE_SER; SEQUENCE 1245 AA; 130894 MW;
                                                                                                                                                                                                                                  PFAM; PF00082; Peptidase_S8; PFAM; PF02225; PA; 1. PRINTS; PR00723; SUBTILISIN.
                                                                                                                                                                                                                                                                                                       "A set of ordered cosmids and a detailed genetic and the 8 Mb Streptomyces coelicolor A3(2) chromosome."; Mol. Microbiol. 21:77-96(1996).

EMBL; AL121596; CAB56662.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SCF51A.10.
Streptomyces coelicolor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9RL54;
01-MAY-2000 (TrEMBLrel. 13,
01-MAY-2000 (TrEMBLrel. 13,
01-OCT-2000 (TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2643
                                                                                                                                                                                                                                                                                                                                                                            STRAIN=A3(2);
                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted (SEP-1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=A3(2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Firmicutes; Actinobacteria; Actinobacterid Actinomycetales; Streptomycineae; Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9RL54
                                                                                                                                                                                                                                                                                              HSSP; P00782;
                                                                                                                                                                                                                                                                                                                                                                   Redenbach M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Murphy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROBABLE SECRETED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2593
                                                                                                                                                                                                                                                                     NTERPRO; IPRO00209; -.
  105
                        123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            333
                                                                     66
                                              54
                                                                                                                   6
                                                                                            N
                       AMAPAIADTDIL-----RHFDLVGFD-----PRGVGHSTPALRCRTDAEFDAYRRDP 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SPPADAALPPPAFSGSAAAFS
LVAAGRLDRDLFDVTALLAQRYDTAHTDALPLIVERAEGVAASSVNALTDLARDASVRE-
                                                                   EIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGAL---LVNPGGPGASAVDMVA 122
                                                                                          RRIRLLAAISAGLALAAGAVAPVPALASTPRPDA-----AAPSADHGTATDHGTATV
                                                                                                                 RRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HPAA-----PAGAGKVVVVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QSVPTSQYAPRPIGPAA-----TARETRPSVPPQQNTGRVPVAPRD----DPRPSPPTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---EPVPPRMWAWIH---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Harris
                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                            1SUE.
                                                                                                                                                                                                                                                                                                                                                                  Kieser H.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    D.;
                                                                                                                                                   4.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GLEE------LASD----DAGGPTPNPAPALLPPPATD
                                               -GRQAASV--
                                                                                                                                                                                                                                                                                                                                                                                                             Barrell B.G., Rajandream M.A.;
e EMBL/GenBank/DDBJ databases.
                                                                                                                                          53;
                                                                                                                                                                                                                                                                                                                                                                  Denapaite D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                  Score 123.5;
Pred. No. 1.3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                         Mismatches
                                                                                                                                                                                                                         UNKNOWN_1.
                                                                                                                                                                                                  1.
74EE92DB9CA1DE60 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Actinobacteridae;
Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA
                                                                                                                                                                                                                                                                                                                                                                   Eichner
                                              -GVLFRTLEQDGHVTVLPSDADA
                                                                                                                                                                DB
                                                                                                                                          230;
                                                                                                                                                              2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       databases
                                                                                                                                                                                                                                                                                                                                                                  Α.,
                                                                                                                                                              Length 1245;
                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                         physical map
                                                                                                                                                                                                                                                                                                                                                                   Cullum
                                                                                                                                         159;
                                                                                                                                       Gaps
                                                                                          53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             441
163
                                              104
                                                                                                                   65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           385
                                                                                                                                         23;
```

```
δõ
                                                                                                RESULT
P70745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                          Query Match
Best Local S
Matches 148
                                                                                                             ACT_SITE
ACT_SITE
ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-FEB-1997 (TrEMBLrel. 02, Created)
01-FEB-1997 (TrEMBLrel. 02, Last sequence update)
01-FEB-1997 (TrEMBLrel. 13, Last annotation update)
01-MAY-2000 (TrEMBLrel. 13, Last annotation update)
GLUCOAMYLASE PRECURSOR (EC 3.2.1.3) (GLUCAN 1,4-ALPHA-GLUCOSIDASE)
(1,4-ALPHA-D-GLUCAN GLUCOHYDROLASE).
                                                                                                                                                                                                                                                       EMBL;
                                                                                                                                                                                                                                                                                                                                         Oguma T., Kurokawa T., Tobe K., Kitao S., Kobayashi M.; "Cloning of the genes for glucodextranase and endodextra Arthrobacter globiformis T.3044."; Submitted (OCT-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                  SEQUENCE
                                                                                                                                                        BINDING
                                                                                                                                                                                   CHAIN
                                                                                                                                                                                                 Hydrolase;
SIGNAL
                                                                                                                                                                                                                              PROSITE;
                                                                                                                                                                                                                                                                                -!- FUNCTION: PRODUCES BETA GLUCOSE FROM DEXTRAN.
-!- CATALYTIC ACTIVITY: HYDROLYSIS OF TERMINAL 1,4-LINKED GLUCOSE RESIDUES SUCCESSIVELY FROM NON-REDUCING ENDS C WITH RELEASE OF BETA-D-GLUCOSE.
                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                           Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Micrococcineae; Micrococcaceae; Arthrobacter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P70745;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P70745
                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=1665;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Arthrobacter globiformis.
                                                                                                                                                                        DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              170
                             Local Similarity
nes 148; Conser
 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15
                                                                                                                                                                                                                                                                       SIMILARITY: BELONGS TO FAMILY 15 OF
 PLSSALLS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --PDWTGAQLKDALISTAVTVDGQKVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATPYQSGVDLARQLGAPLITFDGTQHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QIGAPDVWSAGYR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KPDVTAPGVGIVAARAAGSAMGD-----PVDEHYTAASGTSMATPHVAGAAALLAQRH--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IAGMEWAADQGADVVN------MSLGSSGATDGTDPMSQALNDLSRRTGTLFVVAA 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --GLSY-ADATTGTINALYSPQRWKYLTSGLLGLQRGSD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KDFSGSSGTNDVFGHGTHVASIVGGSGAASGGSRQGVAPAARLLVGKVLGDDGFGSESQV 318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NDYAADCARSPACPLGTDSAQWVNRYHA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISOMAGFQTAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -LDSIDARAVRVDEAELGRFWKRL----VPAGGQRAKAAAATPRVWLDGRVGASLDRSTA 218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MADYSPAGVTHVEQV-----YRQLAQDCVDRMGFSFLANIGTASVARD------MDMVRQ
                                                                                                                                                                                                                                                        D88362; BAA13597.1; -.
                                                                                                                                                                                                                              PS00820;
                                                                                                                                                                                                                                           IPR000165;
                                                                                                                                                                                                               Glycosidase;
                                                                                                10
340
454
457
458
1051
                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                  29
                                                                                                  Α
,
                                                                                                               28
1051
18
340
454
457
458
                                                                                                                                                                                                                           GLUCOAMYLASE; UNKNOWN_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -QFTGSAPRDLCALWPV----PATSTPHPAAPAGAGKVVVVVSTTHDP 461
                                        4.5%;
                                                                                                  110309
FGLLLGGLLLAAP-PLAGATEEPGAG---QTPGAPVVAPQQ 52
                                                                                                                                                                                                 Polysaccharide degradation; POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -RTVGSPGAADAALTVGAVDRDDSLAPFSSRGPRLGDDAV
                             62;
                                                                                POLY-ALA.

POLY-ALA.

SUBSTRATE (BY SIMILARITY).

SUBSTRATE (BY SIMILARITY).

CATALYTIC BASE (BY SIMILARITY).

GENERAL ACID CATALYST (BY SIMILARITY).

INTERACT WITH SUBSTRATES (BY SIMILARITY).
                                       Score 123;
Pred. No. 1
                                                                                                                                                                                   GLUCOAMYLASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -GDGVKVAVLDTGAD-----QSHPDLAGRVAAA 258
                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1051
                                                                                                                                                                                                                                                                    GLYCOSYL HYDROLASES
                                        .2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ą
                           219;
                                                    2;
                                                                                                                                                                                                                                                                                                                                                                      endodextranases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -LVDPLVQKPGKTSDPR- 322
                                                    Length 1051;
                           Indels
                                                                                                                                                                                                            Signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -AGDLLVLAD
                                                                                                                                                                                                                                                                                                 OF.
                             250;
                                                                                                                                                                                                                                                                                                              ALPHA-D-
                                                                                                                                                                                                                                                                                                THE
                          Gaps
                                                                                                                                                                                                                                                                                                CHAINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         367
                             37;
```

```
Ş
                                                                                      망
                                                                                                                          Qy
                                                                                                                                                                          В
                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                     Вр
                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ВР
    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
735 NTTVSGTTAAAKVYVSVNGNIFEAPLTPAGDGTSTFSVDLA-----LPATKNTVTV 785
                                                                                                                                                                          681 SWAMA-QYVR-----LAAGIKNGSPVETPKNVAQRYASGAVGKPALTINSPAQLTTADSA 734
                                                                                                                                                                                                                                                                 632 NGQDALPYLATMHSAANQGFMIPEQVWDQDEPTSYGHELGRSTG------SASPL 680
                                                                                                                                                                                                                                                                                                       355 RGSDAGDLLVLAD-------DYDGRDADGHYSNDQDAFNAVRCVYAPTPADPA 400
                                                                                                                                                                                                                                                                                                                                                     590 --- RMW-HRY-----TYDGYGEKAD--GSPWDGTGVGRLWPLLSGERGEY-----ALA 631
                                                                                                                                                                                                                                                                                                                                                                              295 TDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQ 354
                                                                                                                                                                                                                                                                                                                                                                                                                                         542 AGVHPENAVLDGGFLEFVRLGVKPPADAHVADSIAE-----TDASISQETPGG 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           434 AKELKPAADYLVAAGPKTPQERWEETGGYSTSTLASQIAALAAAGDIAEKNG-----DVG 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        164 AYRRDPMADYSPA-------GVTHVEQVYRQLAQ-----DCVDRMGFSFLANIG 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      374 TDAARRGVEWLFKYQQQPDGHFPQTSKVDGTVGQNGIQLDETAFPILLANQIGRTDADFY 433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               314 DVSLMTVKAHEDKTFPGAWIASLTTPWGQVANAEQHREGYHAVWARDMYQSVTALLAAGD 373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              254 EFSLALGFGANAEEAVNTANTSVSRGFPKVSKDYTKEWKKYLQSLDKPAKALDGELRTQY 313
                                                                                                                               451 KVVVVSTT------HDPATPYQSG-----VDLARQLGAPLITFDGTQHTAVF 491
                                                                                                                                                                                                                     401 AWVAADQRIRQVAPFLSYGQFTGS---APRDLCALW-----PVPATSTPHPAAPAGAG 450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  244 FGTHVRAMVLDGAI------DPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLG 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      206 TASVARDMDMVRQALGDD-QINYLGYSYGTK----LGTAYL-----ER 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                194 PVASALVSSSGFSATSTGYVGTSDGGTDLAADGKLDGAYPEAGPGNIAQTGRIPLTGAKT 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               90 KLAVIRVPATGOR-----FGALLVNPGGPGASAV------DMVAAMAPAIA--D 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     53 SWNSCREFIADTSEIRTARCATVS-----VPVDY-------DQPG------GTQA 89
```

rch completed: January 5, 2001, 14:30:37 time: 329 sec

P38058 O53951 P10291 Q14839 P07061 P22406 P52002 P52002 P646372 P55356 P42604

herpes simp homo sapien flavobacter

clostridium mycobacteri

streptomyce
pseudomonas
herpes simp
herpes simp
rhodococcus
rhizobium s
escherichia

```
Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              hits satisfying chosen parameters:
        88757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-461-774-4
2738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SwissProt_39:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    January 5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAMWRRRPLSSALLSFGLLL....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000000000
    n Match 0%
n Match 100%
g first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GenCore
(c) 1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2001, 14:31:05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        32294092 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gapext
                     YM23_MYCTU
YMAR_ECOLI
PIP_AERSO
COBG_PSEDE
PSE_HUMAN
KAS2_STRCM
LE18_PRVIF
MCAS_MYCBO
OMPA_SERMA
AMYA_ASPAW
LYS9_YEAST
SYL_MYCTU
CTPI_MYCTU
ODP2_HUMAN
ILVB_MYCTU
ODP2_HUMAN
ILVB_MYCTU
ODP2_HUMAN
ILVB_MYCTU
ODP2_HUMAN
ILVB_MYCTU
CTPI_MYCTU
ODP2_HUMAN
ILVB_MYCTU
CTPI_MYCTU
ODP2_HUMAN
ILVB_MYCTU
CTPI_MYCTU
ODP2_HUMAN
ILVB_MYCTU
CTPI_MYCTU
ODP2_HUMAN
ILVB_MYCTU
CO4_HUMAN
POLN_AMNON
POLN_BMNL5
RAT_HALHA
GCSP_MYCTU
CO4_HUMAN
POLN_BMNL5
CO14_BPML5
LEU2_MYCTU
CHIT_STRLI
AMYA_ASPORM
Y4MM_RHISN
CP78_MAIZE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        e version
3 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ....AVMHYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Search time 35.06 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             478.056
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (without alignments
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                88757
  Q10508
Q10508
P34211
P46547
P23246
P11176
P111675
Q022905
Q02905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Description
6 pseudomonas
7 mycobacteri
9 streptomyce
9 aspergillus
2 rhizobium s
0 zea mays (m
7 halobacteri
                                                                                                                                                                                                                                            5 serratia ma
5 aspergillus
6 aspergillus
9 saccharomyc
0 mycobacteri
0 mycobacteri
5 h dihydroli
8 mycobacteri
5 mycobacteri
6 mycobacteri
6 streptomyce
3 trypanosoma
halobacteri
                                                                                                                                                                                  mycobacteri
homo sapien
manchester
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pseudomonas
homo sapien
streptomyce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pseudorabie
mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     mycobacteri
escherichia
                                                                                                                                            mycobacteri
escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aeromonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mycobacteri
                                                                                                                                                                                  RESULT 1
YM23_M
YM25_M
YM25_M
AC Q10508
AC Q10508
AC Q10508
AC Q10-OCT
DT Q1-OCT
DT Q1-OCT
DT Q1-OCT
CC Actinc
RN SEQUEN
RC STRAIN
RX MEDLIN
RT COMple
RT COMple
RT COMple
RT COMple
RT COMple
RT TUBER
DR TUB
    망
                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A MEDILINE-9825987; PubMed-9634230;

A Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris D. Gordon S.V., Eiglmeier K., Gas S., Barry E., III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd S., Abries R., Devlin K., Feltwell T., Gentles S., Murphy L., Allous S., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Allous S., Segers J., Quail M.A., Rajandream M.A., Rogers J., Allous S., Segers K., Skelton S., Squares R., Sulston J.E. Taylor K., Whitehead S., Barrell B.G.;

Tomplete genome sequence.";

Nature 393:537-544(1998).

1. Indian Proceedings of Mycobacterium tuberculosis from the complete genome sequence.";
                                                                                Query Match
Best Local Sin
Matches 516;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34
44
44
43
44
43
44
43
                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q10508;
Q101-0CT-1996 (Rel. 34, Created)
Q1-0CT-1996 (Rel. 34, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
HYPOTHETICAL 55.1 KDA PROTEIN RV2223C PRECURSOR.
RV2223C OR MTCY427.04C.
                                                                                                                                                                                  Hypothetical protein; Transmembrane; Signal.
SIGNAL
1 34 POTENTIAL.
CHAIN 35 500 HYPOTHETICAL PR
TRANSMEM 104 124 POTENTIAL.
SEQUENCE 520 AA; 55077 MW; 7D05F1533A4C6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                       TUBERCULIST; RV2223C; ...
INTERPRO; IPR000073; ...
                                                                                                                                                                                                                                                                                                                                                EMBL; 270692; CA
MEROPS; S33.006;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-H37RV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                      PFAM; PF00561; abhydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 үм23_мүсти
                                          \vdash
    N
AAMMRRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CAA94646.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4444600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1848
463
703
1912
392
.456
1046
1235
1235
1237
437
437
                                                                                                      99
                                                                                                      . . .
4 8
8 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NOEK_RHISN
UXAA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YIO2_MYCTU
UL17_HSV11
CHD4_HUMAN
NYLB_FLASK
REP_STRLI
MEXB_PSEAE
DPOL_HSV11
DPOL_HSV1S
YTH3_RHOER
                                                                                Score 2717; I
Pred. No. 9.9e
1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CBPA_CLOCI
                                                                                                                                                                                  HYPOTHETICAL PROTEIN RV2223C.. POTENTIAL.; 7D05F1533A4C6B91 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   520
```

Hol royd

J.E.,

Harris

D.,

Result No.

Score

DB 1; 1.9e-185;

DΒ

Length

0;

Gaps

0;

60

Database

Post-processing:

Minimum

DB DB

seq seq

tal number of

ΑA

Title: Perfect score:

protein

Scoring table:

5

```
YM24_MYCTU
ID YM24_M
C Q10509
AC Q10509
DT 01-OCT
DT 30-MAY
DE HYPOTH
GN RV2224
GN RV20ba
OC Bacter
OC Actino
CRN [1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Dβ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.

STRAIN-H37RV:

STRAIN-H37RV:

MEDLINE-98295987; PubMed-9634230;

MCOLE S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris D.

ACOLE S.T., Brosch R., Cas S., Barry C.E. III, Tekala F.,

ACOLE S.T., Brown D., Chillingworth T., Connor R.,

ACOLE S.T., Basham D., Brown D., Chillingworth T., Connor R.,

ACOLE S.T., Basham D., Brown D., Chillingworth T., Connor R.,

ACOLE S.T., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd S.,

ACOLE S., Devlin K., Feltwell T., Gentles S., Murphy L.,

ACOLE S., Devlin K., Feltwell T., Gentles S., Murphy L.,

ACOLE S., Devlin K., Feltwell T., Gentles S., Murphy L.,

ACOLE S., Sagers J.,

ACOLE S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J.E.

ACOLE S., Whitehead S., Barrell B.G.;

ACOLE S., WHITEHEAD S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q10509;
Q1-OCT-1996 (Rel. 34, Created)
Q1-OCT-1996 (Rel. 34, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
HYPOTHETICAL 55.9 KDA PROTEIN RV2224C PRECURSOR.
RV2224C OR MTCY427.05C.
                                                                                        the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for con entitles requires a license agreement (See http://www.isb-sib.ch/ar or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Actinomycetales; [1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Firmicutes; Actinobacteria Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YM24_MYCTU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TEDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLI 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DLLVLADDYDGRDADGHYSNDQDAFNAVRCVDAPTPADPAAWVAADQRIRQVAPFLSYGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGSDAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGSDAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          270692;
'S; S33.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTELGTAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                             license agreement (See http://www.isb-sib.ch/announce/
license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         42]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .
.
                                                                                                                                                                                           on
```

```
οy
                                                                                                                                                                                                                                                                                                                                                                                                             γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
δÃ
                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                        뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DR DR DR FTT FTT SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                               YUAR_ECOLI
P34211;
01-FEB-1994
01-NOV-1995
01-OCT-2000
                                                                                                                                                                                                                                            _ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hypothetical protein;
SIGNAL 1 2:
CHAIN 23 520
SEQUENCE 520 AA; 59
                                                                                                                                                          HYPOTHETICAL YUAR OR YDDA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PFAM; PF00561; abhydrolase; 1. PROSITE; PS00013; PROKAR_LIPOPROTEIN;
Shimizu
           STRAIN-K12 /
                       SEQUENCE FROM N.
                                               Submitted
                                                                      SEQUENCE FROM
STRAIN-K12 / F
                                                                                                                                  Plasmid
                                                                                                                                             Escherichia
                                                                                                           Escherichia
                                                                                                                      Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TUBERCULIST; RV2224C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INTERPRO;
                                                                                                                                                                                                                                                                                                                    477
                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                245
                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     123
                                                                                                                                                                                                                                                                                             480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ç
                                                                                                                                                                                                                                                                                         GSLLTFDGTQHTVVFQGDSCIDEYVTAYLIGGTTPPSGAKC
                                                                                                                                                                                                                                                                                                                                                     SYGQETGSAPRDICALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLG
                                                                                                                                                                                                                                                                                                                                                                                                                DAGD-LLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                     HALVDPLV-----QKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQWVNRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FQTLPKR-VHERFDLVGFDPRGVASSRPAIWCNSDADNDRLRAEPQVDYSREGVAHIENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADT
                                                                                                                                                                                                                                                                                                                  APLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRC
                                                                                                                                                                                                                                                                                                                                          SYGKFTGDAPLGTCAFWPVPPTSQPHAVSAPGLVPTVVVSTTHDPATPYKAGVDLANQLR
                                                                                                                                                                                                                                                                                                                                                                                          NRGDTLLALADMYMRRDSHGRYNNSGDARVAINCVDQPPVTDRDKVIDEDRRAREIAPFM
                                                                                                                                                                                                                                                                                                                                                                                                                                         HSLVDPLVDPDNPRISRPARTKDPRGLSYSDAIVGTIMALYSPNLWQHLTDGLSELV--D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PQRVRAMILDGAVDPNADPIEAELRQAKGFQDAFNNYAADCAKNAGCPLGADPAKAVEVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TKQFVGRCVDKMGKNFLAHVGTVNVAKDLDAIRAALGDDKLTYLGYSYGTRIGSAYAEEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KIPGGALCGKLAVPVDYDRPDGDVAALALIRFPATGDKIGSLVINPGGPGESGIEAALGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RRDKIARMLLIWAALAAVALV----LVGCIRVVGGRARMAEPKLGQPVEWTPCRSSNPQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                              (SEP-1994)
                                                                                                                      Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IPR000073;
                                                                                                                                                                 (Rel. 28, (Rel. 32, I) (Rel. 40, I) L 55.7 KDA F
                                                                                                                                              coli.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                      M N.A.
            CR63;
                                                                                                                                                                                                                                STANDARD;
                                                                       12435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             520 I
55924 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ın; Signal.
                                               ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              47.0%;
48.8%;
                                                                                                                                                                    Last sequence update)
Last annotation update)
PROTEIN IN OMPP-INT INTERGENIC
                                                                                                                                                                                                          Created)
                                               the
                                                                                                                     gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69;
                                               EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1286.5; D
Pred. No. 1e-83;
9; Mismatches 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HYPOTHETICAL PROTEIN RV2224C; BDC560534ABE9B0E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     POTENTIAL
                                                                                                                      subdivision;
                                                                                                                                                                                                                                499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             UNKNOWN_1
                                                                                                                                                                                                                                ĄΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                      Enterobacteriaceae
                                               databases
                                                                                                                                                                                                                                                                                                                    517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                      REGION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                  476
                                                                                                                                                                                                                                                                                                                                                                                                                416
                                                                                                                                                                                                                                                                                                                                                                                                                                         359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           64
```

Η.,

Saitoh

Υ.,

Suda

Uehara

×.

Sampei G.,

Mizobuchi

```
Query Match
Best Local S
Matches 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INTERPRO: IPRO00073; --
INTERPRO: IPR002410; --
PFAM; PF00561; abhydrolase; 1.
PRINTS; PR00793; PROAMNOPTASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "New outer membrane-associated protease of Escherichia J. Bacteriol. 176:359-367(1994). -i- SIMILARITY: BELONGS TO PEPTIDASE FAMILY S33. -i- SIMILARITY: TO M.TUBERCULOSIS RV2223C AND RV2224C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; X74278; CAA52339.1; -. EMBL; AP001918; BAA97900.1; -PIR; S37474; S37474.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Complete nucleotide sequence of the F plasmid: its implications organization and diversification of plasmid genomes."; Submitted (APR-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hypothetical protein; Hydrolase; SIGNAL 1 26 POT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ECOGENE; EG40043; YUAR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=K12 / ATCC 12435;
MEDLINE=94117370; PubMed=8288530;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE OF 1-226 FROM N.A. STRAIN=K12 / ATCC 12435;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Kaufmann A., Stierhof Y.-D.,
    413
                                                                                                                                                                                                                                                                           245
                                              437
                                                                                             359
                                                                                                                                       387
                                                                                                                                                                                   305
                                                                                                                                                                                                                               327
                                                                                                                                                                                                                                                                                                                     270
                                                                                                                                                                                                                                                                                                                                                                  187
                                                                                                                                                                                                                                                                                                                                                                                                            211
                                                                                                                                                                                                                                                                                                                                                                                                                                                     139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity
QTRLKNTVLPSG---LLFVAHKYDPTTPWINARKMADKFSAPLLTINGDGHTLALAGTNL
                                            ATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLITFDGTQHTAVFDG-NQ
                                                                                        VILCV---DQSDEQ--LSQEQRKSRKKALADAFPAVNFEREQSDLP-EFCELWFIHRDLQ
                                                                                                                                  AVRCVYAPTPADPAAWVAADQR-----IRQVAPFLSYGQFTGSAPRDLCALWPV----P
                                                                                                                                                                                 DDLISLTTELLLWRSSWPTLATAVRQFSQGIVSNEIETALNSSIASE-----KVSDALG
                                                                                                                                                                                                                                                                                                                                                                                         FPAINCQQS-----NQERLVNVSE------KQLILQKINACIHNTGAEVIRHIGSHEAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KLPAKSKRKGSVIIISGGPGLPGIN-----PYINFDWPYTNLRESWDIIGFDPRGVGQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VSARQIEWQSCMTSPYSDWFGKESSSPELLCGYLSVPLKYTDTGKDVSDENIPLVRLAMT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VVAPQQSWNSC-----REFIADTSEIRTARCATVSVPVDYDQPGGTQA------KLAVI 94
                                                                                                                                                                                                                        ADATTGT INALYSPORWKYLTSGLLGLORGSDAGDLLVLADDYDGRDADGHYSNDODAFN
                                                                                                                                                                                                                                                                       KLRQAHSYQETFDRFAAWCARTKSCPLSSDRNQAIHQFHQLLLKLHNSPLTDSRGESISS
                                                                                                                                                                                                                                                                                                                                                               YDIERIRQALGDKQLTAVAYSYGTQIAALYAERFPSSIRSIVFDGVVD--IDDLNDNFSW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RVPATGQRFGALLVNPGGPGASAVDMVAAMAPAI----ADTDILRHFDLVGFDPRGVGHS
                                                                                                                                                                                                                                                                                                                   -QMAGFQTAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         27
418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ä,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         26
499
499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        55682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18.0%;
26.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 493; DB
Pred. No. 1e-2
96; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NTVLPSGLLEVAHKYDPTTPWINARKMADKFSAPLLTINGD GHTLALAGTNLCVDEAVVRHLLEPGKSEDITCQGSGTGDTN -> ILEYHPVYCLWHYNWIRQLPG (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HYPOTHETICAL PROTEIN YZZE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Henning U.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B12589807134A26A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Signal; Plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ); DB 1; Length 499; le-27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          198;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 coli K-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                       436
                                                                                                                                                                                                                          386
                                                                                                                                                                                                                                                                                                                   326
                                                                                                                                                                                                                                                                                                                                                                                                                                                     186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  84
                                            495
                                                                                          412
                                                                                                                                                                                                                                                                                                                                                                                                         269
                                                                                                                                                                                                                                                                       304
                                                                                                                                                                                                                                                                                                                                                             244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16;
```

Q

맑 δÃ B Qy В Qy

밁

Qy

DЬ δÃ

망

Вb

Qy

Ş

DR DR DR DR DR DR DR DR DR FT FT FT FT FT FT

```
RESULT 4
PIP_AERSO
                   Ωy
                                                 DЬ
                                                                        Qγ
                                                                                                   DЬ
                                                                                                                        Ş
                                                                                                                                                    DЬ
                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
 B
                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PIP_AERSO
P46547;
01-NOV-1995
                                                                                                                                                                                                                                                               INIT_MET
ACT_SITE
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P46547;
01-NOV-1995 (Rel. 32, Createo)
01-OCT-1996 (Rel. 34, Last sequence update)
01-OCT-1996 (Rel. 34, Last annotation update)
01-OCT-1996 (Rel. 34, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  J. Biochem. 116:818-825(1994).
-!- FUNCTION: HIGHER ACTIVITY TOWARD LONG PEPTIDES.
HYDROXYPROLINE BETA NAPHTHYLANIDE WITH ALMOST A
                                                                                                                                                                                                                                                                                                                                                                                                                            use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Aeromonas
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                 EMBL; D30714; BAA06380.1; -. MEROPS; S33.001; -.
                                                                                                                                                                                                                                                                                                                                                                                                      or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                   entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                     the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     between
                                                                                                                                                                                                                                                                                                    Hydrolase; Aminopeptidase
                                                                                                                                                                                                                                                                                                                 PRINTS; PR00793; PROAMNOPTASE.
                                                                                                                                                                                                                                                                                                                            PFAM; PF00561; abhydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            enzyme.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Isolation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Kitazono A., Kitano A., Tsuru D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A., AND PARTIAL S
MEDLINE=95189781; PubMed=7883756;
                                                                                                                                                                                                                                                                                                                                          INTERPRO; IPRO00073; -. INTERPRO; IPRO02410; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (pap) from Aeromonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Aeromonas
 162
                        248
                                                 102
                                                                                                                           132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     496
                                                                          189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            470 CVDEAVVRHLL
                                                                                                  73
                                                                                                                                                    19
                                                                                                                                                                            76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY: BELONGS TO PEPTIDASE FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SUBUNIT: HOMOTETRAMER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CATALYTIC ACTIVITY: RELEASE OF A N-TERMINAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AS ON PROLINE BETA-NAPHTHYLAMIDE.
LHEVYLTG----GVAPIGRSADEVYRATYQRVADKNRAFFARFPHAQAIANRLATHLQRH 217
                                                                                                                DI---LRHEDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQL 188
                                                                                                                                                  TVPLDHQQPDDEETITLFGRTLCRKDRLDDELPWLLYLQGGPG
                                                                                                                                                                            SVPVDYDQPGGTQAKLAVIRVPATGQRFGA----LLVNPGGPGASAVDMVAAMAPAIADT 131
                        VRAMVLDGAIDPAVSPIEESISQM--AGFQTAFNDYAADCARSP-----
                                                             AQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQ-INYLGYSYGTKLGTAYLERFGTH
                                                                                                  WIKRALQEFRVLLLDQRGTGHSTP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CVDSAVMHYFL
                                                 \texttt{LAHLNPRQQADYLSHFRADSIVRDAELIREQLSPDHPWSLLGQSFGGFCSLTYLSLFPDS}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the Swiss Institute of Bioinformatics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           proteobacteria;
                                                                                                                                                                                                                                                                                                                                        IPR002410;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and characterization of the
                                                                                                                                                                                                                                                                424 AA;
                                                                                                                                                                                                                                                                           145
                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     506
                                                                                                                                                                                                                                                                145
48274 MW;
                                                                                                                                                                                                             4.78; 22.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sobria:
                                                                                                                                                                                                   41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gamma
                                                                                                                                                                                                                Score 128.5; DI
Pred. No. 0.047;
                                                                                                                                                                                                                                                                POTENTIAL.
; E9DD968E490047DC CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      comparison
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Yoshimoto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      prolyl ami
on with the
                                                                                                                                                                                                                                                                                                                                                                                                                                         There are no restrictions ng as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AΑ
                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                    143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S33.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               T.;
                                                                                                                                                                                                                                                                                                                                                                                                                            Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AMINOPEPTIDASE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Aeromonadaceae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aminopeptidase
the Bacillus coa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROLINE FROM
                                                                                                                                                    -----FGAPRPSANGG
                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                          Length 424;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AS
                                                                                                                                                                                                                                                                                                                                                                                                                               bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACTS (
                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ဝွ
                                                                                                                                                                                                    113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      coagulans
                        ACPLGTD
                                                                                                                                                                                                                                                                                                                                                                                                                               is in no way for commercial
                                                                                                  IHAEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACTIVITY
                                                                                                                                                                                                   Gaps
                                                                                         101
                                                                                                                                                    72
                                                 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                        on
                                                                                                                                                                                                     17;
```

```
RESULT 5
COBG_PSEDE
                                                                                                                                                                                                                                     ~₽
                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DT AC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                             Query Match
Best Local S
Matches 89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P21637;
01-MAY-1991 (
01-FEB-1996 (
01-FEB-1996 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                 PRINTS; PR00397; SIROHAEM. PROSITE; PS00365; NIR_SIR; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; M59301; AAA25795.1; PIR; B36145; B36145.
                                                                                                                                                                                                                                                                                                                                                             METAL
                                                                                                                                                                                                                                                                                                                                                                                                             Cobalamin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=91008976; PubMed=2211521;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pseudomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COBG_PSEDE
              106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          297
                                                              22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PATHWAY: COBALAMIN BIOSYNTHESIS.
SIMILARITY: THE C-TERMINAL DOMAIN IS A 4FE-4S/SIROHEME DOMAIN FOUND IN UTTRITE REDUCTASES (EC 1.6.6.4 AND EC 1.7.7.1) AND SULFITE REDUCTASES (EC 1.8.1.2 AND EC 1.8.7.1).
                 GLAIEVPPLAGIDPDEIADPRPIA---
                                                           GLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVSVPVDY 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ERVRGEFPALAWAQGKDFAFTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QRIRQVAPFLSYGQ----FTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SDAGDLLVLADDYDGRDADGHYSNDQDA---FNA-----VRCVYAPTPADPAAWVAAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DVRLPNGQRLTVEQLQQ------QGLDL--GASGAFEELY-----YL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRG
                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                     biosynthesis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IPR001899;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IPR000660; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Proteobacteria
                                                                                                                                                                                                                                     459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (Rel. 18, Created)
(Rel. 33, Last sequence update)
(Rel. 33, Last annotation update)
N (EC 1.-.-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --LEDAFIGEKLNPAFLYQVQAMQPFNTNPVFAILHELIYCEGAA--SHWAA--
                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          denitrificans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                   46690
                                                                                                                                    4.1%;
                                                                                                                                                                                                                                                                                                                                                                                                        Porphyrin biosynthesis; Oxidoreductase;
                                                                                                                                                                                                                                   ₩.
                                                                                                             49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ELIMINATION OF C-20 IN PRECORRIN-6W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    321
                                                                                                                                    Score
Pred.
                                                                                                                                                                                                                                                                                IRON-SULFUR (IRON-SULFUR (IRON-
                                                                                                                                                                                                                                                         (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                   SY SIMILARITY).
EC101F4C1FDC7209 CRC64;
                                                                                                             Mismatches
                                                                                                                                    113.5;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               459
              TELREAL-DVRQVPLKLAPKLSVVIDS 155
                                                                                                                                                                                                                                                                             (4FE-4S)
(4FE-4S)
(4FE-4S)
(4FE-4S)
                                                                                                                                      . 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA
                                                                                                                                                          DB
                                                                                                             152;
                                                                                                                                                          ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rouyez M.-C.,
                                                                                                             Indels
                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                AND SIROHEME
                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL).
                                                                                                                                                                                                                                                                                                           (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'n
                                                                                                             93;
                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             251
                                                                                                             20;
```

```
RESULT 6
CCCCCCCCCCCCCCCCTTTAXXCTRRRRRRRCCOCCCTTTTAXXCCTX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PSF_HUMAN
P23246;
01-NOV-1991
                                                                                                                                                                                                                                                                                                                                          PROTEIN (PTB).

- SUBCELLULAR LOCATION: NUCLEAR.

- SUBCELLULAR LOCATION: NUCLEAR.

- I ALTERNATIVE PRODUCTS: TWO FORMS OF PSF ARE LIKELY TO BE PRODUBY ALTERNATIVE SPLICING OF THE SAME GENE.

BY ALTERNATIVE SPLICING OF THE SAME GENE.

- I SIMILARITY: CONTAINS 2 RNA RECOGNITION MOTIFS (RRM).

- I CAUTION: WAS ORIGINALLY (REF. 2) THOUGHT TO BE MYOBLAST CELL SURFACE ANTIGEN 24.1D5 AND A POSSIBLE MEMBRANE-BOUND PROTEIN
                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN the European Bioinformatics Institute. There are no restricted the companion of the companion 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GOWER H.J., MOORE S.E., DICKSON G., ELSOM V.L., Nayak R., Walsh F.
"Cloning and characterization of a myblast cell surface antigen
defined by 24.1D5 monoclonal antibody.";
Development 105:723-731(1989).
- FUNCTION: ESSENTIAL PRE-MRNA SPLICING FACTOR REQUIRED EARLY IN
SPLICEDSOME FORMATION. BINDS TO THE MANMALIAN POLYEYRIMIDINE
TRACTS. FORMS A COMPLEX WITH THE POLYPYRIMIDINE TRACT-BINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDITINE 93194059; PubMed=8449401;
MEDITINE 93194059; PubMed=8449401;
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B., Galceran J., Tempst P., Nadal-Ginard B
Patton J.G., Porro E.B.,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-OCT-1996
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TISSUE=FETAL SKELETAL MUSCLE; MEDLINE=90091812; PubMed=2480877;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 312-707 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PTB-ASSOCIATED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TISSUE=FETAL BRAIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mammalia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           factor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QRWKYLTSGLLG--LQRGSDAGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LVGFDPRG----VGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVD 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LVETAPELLDGSLTVHLSGCAKGCARPKPSELTLVGAPSG--YGLVVNGAANGLPSAYTD 415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GLGLAF-AQVEAAALASYLHQV-QALGANAIRLAPGHAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ENGMGSALARLGRLVRQNKDAGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --GLCPETAAVAQSLAASHGFRIAEQDPRNAIATCAGSKGC-----ASAWMET-KGMAER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DGAIDPAVSPIEESISQMAGFQTAFND---YAADCARSPACPLGTDSAQWVNRYHALVDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RMGFSFLANIGTASVARDMDMVRQALGDDQINYL-GYSYGTKLGTAYLERFGTHVRAMVL 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SLGTTMRGRDLDPSEIRALCRCETSSE-----RPAAPRSAA----IPGIHALGNADTVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGREGLGAVVADIRLQAVSTVAGVAWVLSLGGTSTKASSVGTLAGNAVVPALITTLEKLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DQPGGTQAKLAVIRVPATGQRFG-ALLVNPGGPG--ASAVDMVAAMAPAIADTDILRHFD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Eutheria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7:393-406(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Metazoa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (Rel. 20, Created)
(Rel. 34, Last sequence update)
(Rel. 39, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SPLICING FACTOR (PSF).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Chordata;
Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AND PARTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----KPGK---TSDPRGLSYADATTGTINAL---YSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Craniata; Vertebrata; Euteleostomi; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                                                                               EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BE PRODUCED
                                                                                                                                                                                                                                                      D
                                                                                                                                                                                                                   collaboration
L outstation -
                                                                                                                                                                                                               outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        265
```

use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).

restrictions

on

```
RESULT 7
KAS2_STRCM
ID KAS2_STRCM
                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                     δÃ
                                                                                                                                                                 밁
                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTER
                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARSPLIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PFAM; PF00076; rrm;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIR; A43557; A43557.
HSSP; P19339; 1SXL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; X70944; CAA50283.1;
EMBL; X16850; CAA34747.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nuclear protein; RNA-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROSITE; PS00030;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INTERPRO; IPRO00504;
                                                                                           493
                                                                                                                             342
                                                                                                                                                                 435
                                                                                                                                                                                                    295
                                                                                                                                                                                                                                        376
                                                                                                                                                                                                                                                                         254
                                                                                                                                                                                                                                                                                                             331
                                                                                                                                                                                                                                                                                                                                                 194
                                                                                                                                                                                                                                                                                                                                                                                    288
                                                                                                                                                                                                                                                                                                                                                                                                                        141
                                                                                                                                                                                                                                                                                                                                                                                                                                                          232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          26
                                                                                                                             RWKYL
                                                                                                                                                                 VFLLTTTPR-PVIVEPLEQLDDEDGLPEKLAQKNPMYQKERETPPRFAQHGTFEYEYS-Q
                                                                                                                                                                                                                                                          DGAIDPAVSP--IEESISQMAGFQTA------
                                                                                                                                                                                                                                                                                                             -GKGFGFI-KLESRALA---EIAKAELDDTPMR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                          KPPHRGGGEPRGGRQHHPPYHQQHHQGPPPGGPGGRSEEKISDSEGFKANLSLLRR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -GVPTTPPQAGGPPPPPAAVPGPGPGPKQGPGGPKGGKMPGGPKPGGGPGLSTPGGHP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VSVPVDYDQPGGTQAKLAVIRVPATGQRFG--------ALLV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATPPTSGAPPGSGPGPTPTPPPAVTSAPPGAPPPTPPSS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAPPLAGATEEPGAGQT------PGAPVVAPQQSWNSCREFIADTSEIRTARCAT
                                                                                                                                                                                                  TDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYAD---
                                                                                                                                                                                                                                  RN-LSPYVSNELLEEAFSQFGPIERAVVIVDDRGRSTGKGIVEFASKPAARKAFERCSEG
                                                                                                                                                                                                                                                                                                                                             DRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVL
                                                                                                                                                                                                                                                                                                                                                                                                                      GFDPRGVGHSTPALRCR-----TDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                  ---PGEKTYTQRCRLFVGNLPADITEDEFKR-LFAKYGEPGEVFINK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      00076; rrm; 2.
PS50102; RRM; 2
                                                                                                                             346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299
332
9
19
10
10
20
20
56
67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ã,
   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RRM_RNP_1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3304
3399
111
217
217
2266
1527
277
1188
597
597
707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 76149 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POLY-PRO.
DBHS.
DBHS.
POLY-ARG.
POLY-GLY.
POLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .' .'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----NPGGPGASAVDMVAAMAPAIADTDILRHFDLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 105.5; | Pred. No. 3.7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     POLY-GLY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              POLY-GLN.
POLY-PRO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  POLY-PRO.
POLY-GLN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              mRNA splicing, Alternative RNA-BINDING (RNP1). RNA-BINDING (RNP1). 3 X 3 AA REPEATS OF R-G-G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GLN/GLU/PRO-RICH
   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
   402
   AA
                                                                                                                                                                                                                                                                        ---FNDYAADCARSPA---CPLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           139;
                                                                                                                                                                                                                                                                                                             -GRQLRVRFATHAAALSV
                                                                                                                                                                                               ---ATTGTINALYSPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               707;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 splicing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74
                                                                                                                                                                 492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               231
                                                                                                                                                                                                  341
                                                                                                                                                                                                                                    434
                                                                                                                                                                                                                                                                                                             375
                                                                                                                                                                                                                                                                                                                                                                                                                      193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      172
                                                                                                                                                                                                                                                                                                                                                                                    330
                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                                                                                                                 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                          287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18;
```

```
Qy
                                                                밁
                                                                                                Qy
                                                                                                                                                                 οy
                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                            ф
                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                   밁
                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 115; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P41176;
01-FEB-1995 (Rel. 31, Created)
01-FEB-1995 (Rel. 31, Last sequence update)
01-FEB-1995 (Rel. 31, Last annotation update)
PUTATIVE POLYKETIDE BETA-KETOACYL SYNTHASE 2 (EC 2.3.1.-) (ORF 2).
Streptomyces cinnamonensis.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN-A3823.5;
STRAIN-B92374994; PubMed=1508151;
MEDLINE=92374994; PubMed=1508151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERPRO; IPRO00794; -.
PFAM; PF00109; ketoacyl-synt; l..
PFAM; PF00109; ketoacyl-synt; l..
Antiblotic biosynthesis; Transferase; Acyltransferase.
SEQUENCE 402 AA; 41270 MW; 348657D10201C214 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on it
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Characterisation of actI-homologous DNA encoding polyketide syrgenes from the monensin producer Streptomyces cinnamonensis.";
MO1. Gen. Genet. 234:254-264(1992).

-i- PATHANA: BIOSYNTHESIS OF THE POLYKETIDE ANTIBIOTIC MONENCIN-
-i- MISCELLANEOUS: THIS PUTATIVE KETOACYL SYNTHASE LACKS THE ACT
SITE CYSTEINE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Actinomycetales; Streptomycineae; Streptomycetaceae; [1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; Z11511; CAA77597.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Robinson J.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
336
                                 424
                                                                                                                                     241
                                                                                                                                                                                                       188
                                                                                                                                                                                                                                                                          136
                                                                                                                                                                                                                                                                                                            198
                                                                                                                                                                                                                                         257
                                                                                                                                                                                                                                                                                                                                                                              138
                                                                                                                                                                                                                                                                                                                                              90
                                                                                                                                                                                                                                                                                                                                                                                                                40
                                                                                                                                                                                                                                                                                                                                                                                                                                                  82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY: BELONGS TO THE BETA-KETOACYL-ACP SYNTHASES FAMILY.
AAPLDVACALL---
                              SAPRDL-CALWPVPATSTPHPAAPAGAGKVVVVSTTH-DPATPYQSGVDLARQLGAPLIT
                                                                                                                                     AEAAPARGAEVYGEA--GPLARLPAPH----
                                                                                                                                                     WFYAVNSGQISIRHGMKGPSGVVVSDQAGGL-----DALAQARRLVRKGT----PLIVCGA
                                                                                                                                                                                                                                                                                                                                                                       DLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GMGIAAPNGLG---RPTTGRPPWAP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVSVPVDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S25077; S25077
                                                                 GDIRRVFADGGGRYPNDRAEAEAISEVFGP-----
                                                                                                 -----RDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQF-TG
                                                                                                                                                                                                     VEPRSAPGAGSPSSPAG---GMSD--SDEPNRAYLPFDRDGRGYVPGGGRGVVPPL--ER
                                                                                                                                                                                                                                     IDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQWV-NRYHALVDPLVQKP
                                                                                                                                                                                                                                                                                                         FSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTA-YLERFGTHVRAMVLDGA
                                                                                                                                                                                                                                                                                                                                          EVAAFDPLDMGVVT----ASHAGGFEFGQDELQKLLGQG-QPVLSAYQSFA------
                                                                                                                                                                                                                                                                                                                                                                                                              -DPSGYPAQLAG-EIPG----FRAAEHLPGRLVPQTDRVTRLSLAAADWALADAGV----
                                                                                                                                                                                                                                                                                                                                                                                                                                              DQPGGTQAKLAVIRVPATGQRFGALLVNPGG--PGASAVDMVAAMAP-~AIADTDILRHF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3.8%; Score 104;
24.0%; Pred. No. 2.
tive 50; Mismatche
AMRAG - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sherman D.H.,
-VIPPTVHIDPCPEYDLDLVLYQVRPAALRT
                                                                                                                                     ·SG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB . 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1; Length 402;
                                                                                                                                   RGSTRAHAIRTALDDAGTAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Birch A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----RAASAASTRF----
                                                                -GRVPVTCPRTMTGRLHSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Hopwood
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  synthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D.A.,
                              481
                                                                                                 423
                                                                                                                                                                                                                                         315
                                                                                                                                                                                                                                                                         187
                                                                                                                                                                                                                                                                                                          256
                                                                                                                                                                                                                                                                                                                                            135
                                                                                                                                                                                                                                                                                                                                                                                                                89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   81
381
                                                                 335
                                                                                                                                   287
                                                                                                                                                                   371
                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                              197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29;
```

```
٠ b
                                       Q
                                                                        멍
                                                                                                  δÃ
                                                                                                                                   ₽
                                                                                                                                                              δÃ
                                                                                                                                                                                               В
                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                ACC OCC OCC RAP RAY
                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                              Early protein; Transcration; DNA-binding; Phosphorylation; OWAIN 390 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IE18_PRVIF
P11675;
01-OCT-1989
01-APR-1990
01-FEB-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _PRVIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for contents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cheung A.K.;
Submitted (NOV-1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE-89315207; PubMed=2546124; Cheung A.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Viruses; dsDNA viruses, no RNA stag
Alphaherpesvirinae; Varicellovirus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PIR; S04713;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a license agreement (Su or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          pseudorabies virus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REVISIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nucleic Acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pseudorabies virus (strain Indiana-Funkhauser / Becker) (PRV)
Viruses; dsDNA viruses, no RNA stage; Herpesviridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ε
                                                                                                                                                                   139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IMMEDIATE-EARLY PROTEIN IE180
               363
                                                                          321
                                                                                                      193
                                                                                                                                    274
                                                                                                                                                                                                 225
                                                                                                                                                                                                                                                           172
                                                                                                                                                                                                                             85
                                                                                                                                                                                                                                                                                        26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mitted (NOV-1989) to the EMBL/GenBank/DDBJ databases.
FUNCTION: THIS IE PROTEIN IS A MULTIFUNCTIONAL PROTEIN CAPABLE
OF MIGRATING TO THE NUCLEUS, BINDING TO DNA, TRANS-ACTIVATING
OTHER VILAL GENES, AND AUTOREGULATING ITS OWN SYNTHESIS.
SUBCELLULAR LOCATION: NUCLEUS OF INFECTED CELLS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIMILARITY: BELONGS TO THE ICP4/IE140/IE180 FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PTM: A LONG STRETCH OF SERINE RESIDUES MAY BE A MAJOR SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PHOSPHORYLATION.
                                                                                                      VDRMGFSFLANIGTASVARDMDMVRQALGDDQINY-LGYSYGTKLGTAYLERFGTHVRAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nucleotide sequence analysis
               --DSDLSPARSPSAPRAPAAAAAAARRSASSSSSSSSSSSSSSEGEEDEGVRPGAPL-
                                            VLDGAIDPAVSP--
                                                                          EDGLG---LAGDGGAPLQRQPR--RRRAGEGALRRGRGFSSSSSGGS--------
                                                                                                                                                                 -----LVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDC
                                                                                                                                                                                                                             GGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAMAPAIADTDILRHFD-----
                                                                                                                                                                                                                                                                                      AAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCR-EFIADTSEIRTARCATVSVPVDYDQP
                                                                                                                                    LDEPAAARRLDPRPLGARSPV - -
                                                                                                                                                                                                                                                           AASPASSSGSSGSSGSPG-PSAAPRR-WSPARGDPVGEPGP--AARPRTPAPPA--
                                                                                                                                                                                                                                                                                                                      121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       X15120; CAA33214.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                1461
                                                                                                                                                                                               -AVAAAPA---RRGP--ASPASPAAGPVSAPGGGGAPSGGGDRGRHHHQHREPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (Rel. 12, Created)
(Rel. 14, Last sequence update)
(Rel. 28, Last annotation updat
                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EDBEIF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Res. 17:4637-4646(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                           Transcription regulation; hosphorylation; Nuclear pro
                                                                                                                                                                                                                                                                                                                                                                                                AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                  3.8%;
                                                                                                                                                                                                                                                                                                                                                                                               149833 MW;
                                                                                                                                                                                                                                                                                                                      54;
                                                                                                                                                                                                                                                                                                                                                                                                             POLY-SER.
                                                                                                                                                                                                                                                                                                                                    Score 103.5;
Pred. No. 13;
                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                               7F31E7ABE403B208 CRC64;
                                          -IEESISQMAGFQTAFNDYAADCARSPACPLG
                                                                                                                                    ----SSNPNSSSSSTTTVAVEPVARGPEKD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1461
                                                                                                                                                                                                                                                                                                                                                                                                                                           protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Trans-acting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         immediate-early
                                                                                                                                                                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                                                                                                                                    200;
                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                  Length 1461;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           factor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                    191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of.
                                                                                                                                                                                                                                                          φ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OF
                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                      251
                                                                                                                                                                   192
                                                                                                                                                                                               273
                                                                                                                                                                                                                             138
                                                                                                                                                                                                                                                           224
                                                                                                                                    320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  no
                                                                                                                                                                                                                                                                                                                    31;
```

```
RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                           INTERPRO; IPR001227; -.
INTERPRO; IPR002085; -.
PFAM; PF00698; Acyl_transf; 1.
PFAM; PF00107; adh_zinc; 1.
PFAM; PF00109; ketoacyl-synt; 1.
PFAM; PF00550; pp-binding; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MCAS_MYCBO
Q02251;
Q1-JUN-1994
Q1-JUN-1994
15-JUL-1998
PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Molecular cloning and sequencing of the gene for mycocerosic acid synthase, a novel fatty acid elongating multifunctional enzyme, from Mycobacterium tuberculosis var. bovis Bacillus Calmette-Guerin."; J. Biol. Chem. 267:19388-19395(1992).
                                                                                                                                               EMBL; M95808; AAA25369.1;
PIR; B44110; B44110.
HSSP; Q02054; 1AF8.
                                                                                                                                                                                                                                     between the Swiss Institute of Bioinformatics and the E
the European Bioinformatics Institute. There are no rest
use by non-profit institutions as long as its content
modified and this statement is not removed. Usage by an
                                                                                                                                                                                                         entities requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A., AND PARTIAL S
MEDLINE-92406887; PubMed-1527058;
                                                                                                                  INTERPRO;
                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration -
                                                                                                                                                                                                                                                                                                                                                             -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MYCOCEROSIC
                                                                                                                                   INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                         <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            629 AVSAVAMSRR----YDRTQKTFI 647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                                                                                                                        FORM MYCOCEROSYL LIPIDS.

COFACTOR: CONTAINS 1 COVALENTLY BOUND PHOSPHOPANTETHEINE.
SUBUNIT: HOMODIMER WHOSE MONOMERS PROBABLY HAVE A HEAD TO
                                                                                                                                                                                                                                                                                                                           SUBCELLULAR LOCATION: MEMBRANE-ASSOCIATED. SIMILARITY: PARTIAL TO S.ERYTHRAEA ERYTHRONOLIDE 4, AND TO VERTEBRATE FATTY ACID SYNTHASES.
                                                                                                                                                                                                                                                                                                                                                                                                                                 FUNCTION: CATALYZES THE ELONGATION OF N-FATTY ACYL-COA METHYLAMALONYL-COA (NOT MALONYL-COA) AS THE ELONGATING
                                                                                                                                                                                                                                                                                                                                                                          ARRANGEMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q-SGVDLARQLGAPLITFDGTQHTAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTT------HDP--ATPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AARYRAAAGPVPVFIPEMGDSRKQHEALVRLIYSGAAGEAMSWL---QNPRMQAPDQRFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STNNHLSLMADGPPPTDGPLLTPLGEPWPGSDPPADGRVRYGGAGDSREGLWDEDDVRQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDSAQWVNRYHALVDPLVQKPGKTSDPR-GLSYADATTGTINA-----LYSPQRWKY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LTSGLLGLQR---
            00109; ketoacyl-synt; 1.
00550; pp-binding; 1.
PS00012; PHOSPHOPANTETH
                                                                                     ; IPRO00255; -.; IPRO00794; -.; IPRO01227; -.; IPRO02085; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kolattukudy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ARAGPPPSPPAPAAAPRPSASSASATSSSAAASPAPAPEPARPPRRKRR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SYNTHASE.
B_KETOACYL_SYNTHASE;
               PHOSPHOPANTETHEINE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29, Created)
29, Last sequence up
36, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -CQRRVH--APHGHGSFITGSVTPPLPHIGDAMAAQDPLWALPH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P.E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SNDQDAFNA-VRCVYAPTPADPAAWVAADQRIRQVAPFLSYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         490
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -GSD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3
                                                                                                                                                                                                                       http://www.ish-sib.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -AGDLLV-LADDYDGRDA
                                                                                                                                                                                                                                                                                                                                            SYNTHASE,
                                                                                                                                                                                                                                                                  restrictions
                                                                                                                                                                                                                                         and
                                                                                                                                                                                                                                                                                                                                                                                                                                    AGENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                    HTIW
                                                                                                                                                                                                                                         for
                                                                                                                                                                                                                          .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                           TAIL
                                                                                                                                                                                                                                                                                                                                              MODULE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Trom
                                                                                                                                                                                                                                         commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                    TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    468
                                                                                                                                                                                                                                                       no
                                                                                                                                                                                                                                                                    9
```

way

SO STATE OF THE SECOND
```
Query Match
Best Local S
Matches 91
                                                                                                                                                                                                P04845;
13-AUG-1987
13-AUG-1987
01-NOV-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACT_SITE
ACT_SITE
NP_BIND
NP_BIND
BINDING
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
DOMAIN
                                                                                                                                                                    OMPA.
                                                                                                                                                                                                                                                                         SERMA
                                           "DNA
                                                           SEQUENCE FROM N.A. MEDLINE=85035845; PubMed=6092858; Braun G., Cole S.T.;
                                                                                                                                      Bacteria;
                                                                                                                                                    Serratia
                                                                                                                                                                                  OUTER MEMBRANE
                                                                                                                                                                                                                                                          OMPA_SERMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Transferase; Hydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Fatty
              membrane protein.
                                                                                                                        Serratia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PROSITE;
                               implications for the organisation of
                                                                                                                                                                                                                                                                                                                                   868
                                                                                                                                                                                                                                                                                                                                                                 395
                                                                                                                                                                                                                                                                                                                                                                                               827
                                                                                                                                                                                                                                                                                                                                                                                                                             339
                                                                                                                                                                                                                                                                                                                                                                                                                                                          778
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                              sequence analysis of
                                                                                                                                                                                                                                                                                                                                                                TPADPAAWVAA 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MGTQLLASEPVFAAT-----IAKLEPVIAAESGFS-----VTEAITAQ-QTVT-GI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVSVPV
                                                                                                                                                                                                                                                                                                                                   LP---
                                                                                                                                                                                                                                                                                                                                                                                               GMRREQPLPHGLRGLLTELHRAGAALDYSAL---
                                                                                                                                                                                                                                                                                                                                                                                                                             SPQRWKYLTSGLLG----LQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                         RNTVQFAAAVQAAMEDGYRVFADVSPHPLLTHAVEQTGRSLDM--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LDGA-----IDPAVSPIEESISQMAGFQTAFNDYAA----DCARSPACPLGTDSAQWVNRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DKVQPAVFAVQVALAATMEQTYGVRPGAVVGHSMGESAAAV----VAGALSLEDAAR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DYDQPG--GTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAMAPAIADTDILRHF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VDVASHSPQVDPILDDLAAALADIAPMTPKVPYYSATLFDPREQPVC----DGAYWVDNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IDDVVVSVVASPQSTVIGGTSDTVRDLI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGV----THVEQVYRQLAQDC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TE; PS50075;
acid biosyn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                    marcescens
 Genet. 195:321-328(1984)
                                                                                                                                    Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              biosynthesis; Multifunctional enzyme; Phosphopantetheine;
                                                                                                                                                                                                                                                                                                                                   AHTHA
                                                                                                                                                                                             (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                Rel. 05, C
Rel. 05, L
Rel. 32, L
PROTEIN
                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
,
                                                                                                                                                                                                                                                                                                                                   874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2096
177
623
1578
1780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACP_DOMAIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      430
852
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --VICR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    225577
                                                                                                                                                                                Last sequence up
Last annotation
N A PRECURSOR.
                                                                                                                                                                                                                           Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Oxidoreductase; Ligase; NADP;
BETA-KETOACYL SYNTHASE.
ACYL TRANSFERASE.
                                              the
                                                                                                                                    gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₩.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NADP (ER).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BETA-KETOACYL REDUCTASE.
ACYL CARRIER (ACP).
BETA-KETOACYL SYNTHASE (
ACYL TRANSFERASES (BY SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACYL TRANSFERASE ENOYL REDUCTASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----RSKLMTRIAGAGAMGSVELPAKQVNSELMARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PHOSPHOPANTETHEINE (BY SIMILARITY)
W; CC658215D7155300 CRC64;
                                              Serratia marcescens ompA gene:
                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HALVDPLVQKPGKTSDPRGLSYADATTGTINALY
                                                                                                                                    subdivision;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        No.
                                                                                                                                                                                                              update)
                                àn
                                                                                                                                                                                                                                                          359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          26;
                                enterobacterial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DВ
                                                                                                                                                                                                                                                          Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1;
                                                                                                                                    Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----ARWEQRDVMAREVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 2110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              E (BY SIMILAI SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Membrane
                                                                                                                                                                                                                                                                                                                                                                                               YPAGRLVDAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIMILARITY).
                                outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          148;
                                                                                                                                                                                                                                                                                                                                                                                                                                                          SVAALA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         679
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             79
                                                                                                                                                                                                                                                                                                                                                                                               867
                                                                                                                                                                                                                                                                                                                                                                                                                             394
                                                                                                                                                                                                                                                                                                                                                                                                                                                          826
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18;
                                                                                                                                                                                                                                                                                                                                                                              $\times \text{T} = \te
                                                                                                                   В
                                                                                                                                               Qy
                                                                                                                                                                                밁
                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                          рь
                                                                                                                                                                                                                                                                   QΥ
   g
                          Qy
                                                           ₽
                                                                                      Š
                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This SWI
between
                                                                                                                                                                                                                                                                                                                                                                                            DOMAIN
DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TRANSMEM
TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Porin.
SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; X00618; CAA252
PIR; S07298; S07298.
                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Outer membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CHAIN
   273
                                                           213
                                                                                                                      177
                                                                                                                                                    201
                                                                                                                                                                                  129
                                                                                                                                                                                                              155
                               297
                                                                                         261
                                                                                                                                                                                                                                            88
                                                                                                                                                                                                                                                                        95
                                                                                                                                        LANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPA
::||| |
   DAVGSDQYNQKLSEQRAQSVVDYLVSKGIPSDKISARGMGEADAVTG
                               SAQWVNRYH
                                                           PAPAPAPVVETKRFTLKSDVLFNFNKSTLKAEGQQALDQLYTQLSSMDPKDGSVVVLGYT
                                                                                         VSP-----
                                                                                                                      VSNIGDAGTV----GARPDNTMLSLGVSY---
                                                                                                                                                                               RCRTDAEFDAYRRDPMADY - - - - -
                                                                                                                                                                                                                                            RMPYKGS --
                                                                                                                                                                                                                                                                        RVPATGQRFGALLVNPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPAL
                                                                                                                                                                                                                                                                                                       65;
                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                               359
                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                               AA;
                                                                                                                                                                                                                                          -VNNGAFKAQGVQLAAKLSYPIAD-DLDIYTRLGGM-
                                                                                                                                                                                                                                                                                                                                                                                             21
359
40
74
92
1114
133
165
187
204
219
219
211
211
213
336
                                                                                                                                                                                                                                                                                                                    3.7%;
22.6%;
                                                                                       -----IEESISQMAGFQTAFNDYAADCARSP----ACPLGTD
                             -ALVDPLVQK--PGKTSDPRGLSYADATTG
```

Qy

밁 8

밁

27;

91;

104;

Gaps

12;

154

SPAGVTHVEQVYRQLAQDCVDRMGFSF

200

128

-RFGQ----

DDVVAPA

272 296 212 260 176 Score 101; DB Pred. No. 3.3; Mismatches

DB

Length 359; Indels

В Qy 맑 DЬ

Qy В ΩY В

δÃ 망

```
PRINTS; PRO1021; OMPADOMAIN. PRINTS; PRO1022; OUTRMMBRANEA. PROSITE; PS01068; OMPA; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INTERPRO; IPRO00498; -.
INTERPRO; IPRO01145; -.
INTERPRO; IPRO02168; -.
INTERPRO; IPRO02368; -.
PFAM; PF00691; OmpA; 1.
PFAM; PF01389; OmpA_membrane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the European Bioinformatics Institute. There are no restrictions on its most profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SOLUTES (BY SIMILARITY).
SUBUNIT: MONOMER (PROBABLE).
SUBCELLULAR LOCATION: INTEGRAL MEMBRANE
SIMILARITY: BELONGS TO THE OMPA FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FUNCTION: REQUIRED FOR THE ACTION OF COLICINS K AND L A STABILIZATION OF MATING AGGREGATES IN CONJUGATION. SERV RECEPTOR FOR A NUMBER OF T-EVEN LIKE PHAGES. ALSO ACTS WITH LOW PERMEABILITY THAT ALLOWS SLOW PENETRATION OF S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SWISS-PROT entry is copyright. It is produced through een the Swiss Institute of Bioinformatics and the EM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CAA25254.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Transmembrane;
38426 MW;
                                                                                                                                                                                        POTENTIAL.
5 X 2 AA T
                                                                                                                                                                                                                                                                                                                                 POTENTIAL.
                        вч
                                              OMPA-LIKE
                                                                                                                                                                                                                                       POTENTIAL.
                                                                                                                                                                                                                                                                                       POTENTIAL.
                                                                                                                                                                                                                                                                 POTENTIAL.
                                                                                                                                                                                                                                                                                                             POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                 POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                       OUTER MEMBRANE
Y SIMILARITY.
13992A037C19758B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Phage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           recognition; Signal;
                                                                                                                                                                                        TANDEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              There are no restrictions ng as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                       PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PROTEIN.
                                                                                                                                                                                           REPEATS
                                                                                                                                                                                           OF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OUTER MEMBRANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ND L AND FOR THE
. SERVES AS A
ACTS AS A PORIN
4 OF SMALL
                                                                                                                                                                                        A-P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  collaboration
```

```
RESULT 11
AMYA_ASPAW
                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                               뮹
                                                                                                   δÃ
                                                                                                                                                   맑
                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RRC OCC OCC RRC
                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                           Matches 118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-OCT-1996
01-OCT-1996
01-OCT-1996
                                                                                                                                                                                                                                                                                                                                                DISULFID
CARBOHYD
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                ACT_SITE
DISULFID
DISULFID
DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACT_SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE-90254827; PubMed-2340591;
Korman D.R., Bayliss F.T., Barnett C
Kodama K.H., Royer T.J., Thompson S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; X52755; CAA36966.1; HSSP; P10529; 6TAA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              between the Swiss Institute of Bioinformatics and the EMBL outs
the European Bioinformatics Institute. There are no restrictions
use by non-profit institutions as long as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Aspergillus awamori
Eukaryota; Fungi; Ascomycota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hydrolase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            modified and this statement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -I- CATALYTIC ACTIVITY: ENDOHYDROLYSIS OF 1,4-ALPHA-GLUCOSIDIC LINKAGES IN OLIGOSACCHARIDES AND POLYSACCHARIDES.
-I- COFACTOR: BINDS A CALTUM ION REQUIRED FOR ITS ACTIVITY.
-I- SIMILARITY: BELONGS TO FAMILY 13 OF GLYCOSYL HYDROLASES, ALSO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  from Aspergillus niger var. awamori.
Curr. Genet. 17:203-212(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Berka R.M.;
"Cloning, c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         anamorphic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AMYA_ASPAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INTERPRO;
                        118
                                                               49
                                                                                                        70
                                                                                                                                                                                             16
                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KNOWN AS THE ALPHA-AMYLASE FAMILY.
                                                                                                                                                                                           FGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNS-----CREFIADTSEIRT
                                                                                                          ARCATVSVPVDYDQPGGTQA----KLAVIRVPATGQRFGALLVNPGG---PGASA-----
                                                               ATCNT----ADQKYCGGTWQGIIDKLDYIQ----GMGFTAIWITPVTAQLPQTTAYGDAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PF00128; alpha-amylase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             characterization, and expression of two alpha-amylase genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IPR000461; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Glycosidase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Trichocomaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Rel. 34, Created)
(Rel. 34, Last sequence update)
(Rel. 34, Last annotation update)
SE A PRECURSOR (EC 3.2.1.1) (1,4-ALPHA-D-GLUCAN
                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .≱
                                                                                                                                                                                                                                                                                                                                                                         21
498
227
231
231
251
318
318
496
496
                                                                                                                                                                                                                                                               3.7%;
19.4%;
                                                                                                                                                                                                                                                                                                                                                     54880
                    -VDMVAAMAPAIADTDILRHFDLV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Multigene
--
--
--
--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Carbohydrate metabolism;
                                                                                                                                                                                                                                                                                                                                                     ME.
                                                                                                                                                                                                                                      64;
                                                                                                                                                                                                                                                                                                                                            POTENTIAL.

BY SIMILARITY.

BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Barnett C.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Aspergillus
                                                                                                                                                                                                                                                             Score 101; L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Eurotiales;
                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  famil
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        . A . ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (See http://www.isb-sib.ch/announce/
                                                                                                                                                     ----DWRSQSIYFLLTDRFARTDGSTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ward
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Carmona (
Ward M.,
                                                                                                                                                                                                                                                                                   DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Trichocomaceae;
                                                                                                                                                                                                                                           183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Usage
                                                                                                                                                                                                                                                                                 Length 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Wilson
                    GFDPRGVGHSTPALRC 156
=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Calcium;
                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                         (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        L.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL outstation
                                                                                                                                                                                                                                        242;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for
                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              commercial
                                                                                                                                                     48
                                                                                                                                                                                                69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                        33;
```

```
AMYB_ASPAW
ID AMYB_A
AC Q02906
DT 01-OCT
DT 01-OCT
DT 15-DEC
DE GLUCAN
GN AMYB.
OS ASPERG
OC ENKARY
OC ANAMOR
RC STRAIN
RX MEDLIN
RX MEDLIN
RX MEDLIN
RX MEDLIN
RX KOdama
RA GORAM
RC C-!-CO
CC -!- CI
CC -!- 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AMYB_ASPAW
Q02906;
01-OCT-1996
                                                                                                         This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entropean Bioinformatics Institute. There are no restructed by non-profit institutions as long as its content use by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                 "Cloning, characterization, and expression of two alpha-amylass from Aspergillus niger var. awamori.";

Curr. Genet. 17:203-212(1990).

-!- CATALYTIC ACTIVITY: ENDOHYDROLYSIS OF 1,4-ALPHA-GLUCOSIDIC LINKAGES IN OLIGOSACCHARIDES AND POLYSACCHARIDES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-OCT-1996 (Rel. 34, Created)
01-OCT-1996 (Rel. 34, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation update)
ALPHA-AMYLASE B PRECURSOR (EC 3.2.1.1) (1,4-ALPHA-D-GLUCAN
                                                       entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=90254827; PubMed=2340591;
Korman D.R., Bayliss F.T., Barnett C.C.,
Kodama K.H., Royer T.J., Thompson S.A.,
  EMBL; X52756; CAA36967.1;
                                                                                                                                                                                                                                                                                                              -1- COFACTOR: BINDS A CALCIUM ION REQUIRED FOR ITS ACTIVITY.
-1- SIMILARITY: BELONGS TO FAMILY 13 OF GLYCOSYL HYDROLASES,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Berka R.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     anamorphic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GLUCANOHYDROLASE B).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN=UVK143F;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Aspergillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            101
                                                                                                                                                                                                                                                                                       KNOWN AS THE ALPHA-AMYLASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---GGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VRAMVLDGAIDPA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FLDGTLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ILSNKGASGDSYTLSLSGAGYTAGQQLTEVIGCTTVTVGS-----DGNVPVPMA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STTHDPAT ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLIASRNAIRNYAISKDTGFVTYKN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --VAADQRIRQVA-----PFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----DIALAKNVAAFIILNDGIPIIYAGQEQ--HYAGGNDPANREATWLSGYPTDSELY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TSGLLGLQRGSDAGDLLVLADD----YDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DSTL--LGT---FVENH----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CIGEVLDG--DPAYTCPYQNVMDGVLNYPIYYPLLNAFKSTSGSMDDLYNMINTVKSDCP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GDNTVSLPDLDTTKDVVKNEWYDWVGSLVSNYSIDGLRIDTVKHVQKDFWPGYNKAAGVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTASVA-RDMDMVRQALGDDQINYLG-----YSY-GTKLGT------AYLERFGTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RTDAEFDAYRRDPMADYSPAGVTHVEQVYRQL-AQDCVDRMGFSFLAN------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HGYWQQDIYSLNENYGTADDLKALSSALHERGMYLMVDVVANHMGYD--GAGSS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Trichocomaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Fungi; Ascomycota; Eurotiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          awamori.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  - PYQSGVDLARQLGAPLITFDGTQHTAVFDGNQCVDSAVMHY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Aspergillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----VFKPFSSQDYFH--PFCFIQNYEDQTQVEDCWL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ------DNPRFASYTN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --VSPIEESISQMAGFQTAFNDYAADCA
                                                                                     (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ward
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Carmona
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Trichocomaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPIYKDDTTIPMRKGTDGSQIVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Σ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C.L.,
Wilson L.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      alpha-amylase
                                                                                                                                                                       restrictions
                                                                                                                     and
                                                                                                                                                                                                       EMBL
                                                                                                                     ror
                                                                                                                                                                                                                                                                                                                    ALSO
                                                                                                                                                                                                          collaboration
L outstation -
                                                                                                                                                                                                       outstation
                                                                                                                                                  in
                                                                                                                     commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       247
                                                                                                                                                  no
                                                                                                                                                                          on
```

N/O

```
RESULT 13
LYS9_YEAST
ID LYS9_YEAST
AC P38999;
DT 01-FEB-1995
                                                                                                                                                                                                                                                                                                               덩
                                                                                                                                                                                                                     Дd
                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                    õ
                                                                                                                            밁
                                                                                                                                                Ş
                                                                                                                                                                        밁
                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                         γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DR FFT FTT WWW.SQ
                                                                                밁
                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 118; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CHAIN
ACT_SITE
ACT_SITE
ACT_SITE
ACT_SITE
ACT_SITE
DISULFID
DISULFID
DISULFID
DISULFID
DISULFID
CARBOHYD
SEQUENCE
 P38999;
01-FEB-1995 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hydrolase; Gl
Glycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PFAM; PF00128; alpha-amylase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INTERPRO;
                                                                                478
                                                                                                      505
                                                                                                                            429
                                                                                                                                                  456
                                                                                                                                                                        381
                                                                                                                                                                                               403
                                                                                                                                                                                                                      328
                                                                                                                                                                                                                                           347
                                                                                                                                                                                                                                                                   306
                                                                                                                                                                                                                                                                                         287
                                                                                                                                                                                                                                                                                                              248
                                                                                                                                                                                                                                                                                                                                      248
                                                                                                                                                                                                                                                                                                                                                            188
                                                                                                                                                                                                                                                                                                                                                                                 205
                                                                                                                                                                                                                                                                                                                                                                                                        153
                                                                                                                                                                                                                                                                                                                                                                                                                               157
                                                                                                                                                                                                                                                                                                                                                                                                                                                      101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNS-----CREFIADTSEIRT
                                                                                                                                                                                                                                                                  DSTL--LGT----FVENH-------DNPRFASYTN-----
                                                                                                                                                                                                                                                                               RSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYL
                                                                                                                                                                                                                                                                                                              CIGEVLDG--DPAYTCPYQNVMDGVLNYPIYYPLLNAFKSTSGSMDDLYNMINTVKSDCP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ARCATVSVPVDYDQPGGTQA----KLAVIRVPATGQRFGALLVNPGG---PGASA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WSLFLYGLQVAAPALAA-----TPA----DWRSQSIYFLLTDRFARTDGSTT
                                                                                ---GGLP
                                                                                                      FLDGTLP
                                                                                                                                                   STTHDPAT ----
                                                                                                                                                                        KLIASRNAIRNYAISKDTGFVTYKN--
                                                                                                                                                                                              --VAADQRIRQVA-----PFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVV
                                                                                                                                                                                                                                          TSGLLGLQRGSDAGDLLVLADD----YDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAW
                                                                                                                                                                                                                                                                                                                                      VRAMVLDGAIDPA-----
                                                                                                                                                                                                                                                                                                                                                            GDNTVSLPDLDTTKDVVKNEWYDWVGSLVSNYSIDGLRIDTVKHVQKDFWPGYNKAAGVY
                                                                                                                                                                                                                                                                                                                                                                                 GTASVA-RDMDMVRQALGDDQINYLG----YSY-GTKLGT-----AYLERFGTH
                                                                                                                                                                                                                                                                                                                                                                                                                            RTDAEFDAYRRDPMADYSPAGVTHVEQVYRQL-AQDCVDRMGFSFLAN-----I
                                                                                                                                                                                                                                                                                                                                                                                                                                                      HGYWQQDIYSLNENYGTADDLKALSSALHERGMYLMVDVVANHMGYD--GAGSS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATCNT----ADQKYCGGTWQGIIDKLDYIQ----GMGFTAIWITPVTAQLPQTTAYGDAY
                                                                                                                           ILSNKGASGDSYTLSLSGAGYTAGQQLTEVIGCTTVTVGS---
                                                                                                                                                                                                                      ----DIALAKNVAAFIILNDGIPIIYAGQEQ--HYAGGNDPANREATWLSGYPTDSELY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P10529; 6TAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IPR000461; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22
227
231
251
318
318
171
171
261
461
218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Glycosidase; Carbohyo
in; Signal; Multigene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3.7%;
ilarity 19.4%;
Conservative 6
                                                                                                     511
                                                                                                                                                                                                                                                                                                                                                                                                       ----VDYS-----VFKPFSSQDYFH--PFCFIQNYEDQTQVEDCWL
                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21
499
227
231
231
318
318
59
185
185
304
496
496
218
54921
  Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---VDMVAAMAPAIADTDILRHFDLV----GFDPRGVGHSTPALRC
                                                                                                                                                ----PYQSGVDLARQLGAPLITFDGTQHTAVFDGNQCVDSAVMHY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Carbohydrate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 POTENTIAL.

ALPHA-ANYLASE B.
BY SIMILARITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score
Pred.
                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           family.
                                                                                                                                                                                                                                                                                                                                     ----VSPIEESISQMAGFQTAFNDYAADCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      metabolism;
                         446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ç٦
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
                         A
                                                                                                                                                                        -WPIYKDDTTIPMRKGTDGSQIVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 499,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Calcium;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                            DGNVPVPMA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                               455
                                                                                                                                                                                                                                            402
                                                                                                                                                                                                                                                                                                                                                                                                        187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69
                                                                                                                                                                        426
                                                                                                                                                                                                                      380
                                                                                                                                                                                                                                                                  327
                                                                                                                                                                                                                                                                                        346
                                                                                                                                                                                                                                                                                                               305
                                                                                                                                                                                                                                                                                                                                     286
                                                                                                                                                                                                                                                                                                                                                           247
                                                                                                                                                                                                                                                                                                                                                                                 247
                                                                                                                                                                                                                                                                                                                                                                                                                              204
                                                                                                                                                                                                                                                                                                                                                                                                                                                    152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            33;
```

```
В
                         δõ
                                                     В
                                                                           δÃ
                                                                                                      Вb
                                                                                                                               ρy
                                                                                                                                                           B
                                                                                                                                                                                 Qy
                                                                                                                                                                                                                В
                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                          YEPD; 8416; -.
SGD; S0005333; LYS9.
Lysine biosynthesis;
SEQUENCE 446 AA; 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content modified and this statement is not removed. Usage by and entities requires a license agreement (See http://www.isb-sorsend an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-FEB-1995 (Rel. 31, Last sequence update) 15-DEC-1998 (Rel. 37, Last annotation update) SACCHAROPINE DEHYDROGENASE (NAD+, L-GLUTAMATE LYS9 OR LYS13 OR YNR050C OR N3461. Saccharomyces cerevisiae (Baker's yeast). Eukaryota; Fungi; Ascomycota; Saccharomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -!- CATALYTIC ACTIVITY: N6-(L-1,3-DICARBOXYPROPYL)-L-LYSINE + H(2)0 = L-GLUTAMATE + 2-AMINOADIPATE 6-SEMIALDEHYDE + -!- PATHWAY: SEVENTH STEP IN LYSINE BIOSYNTHESIS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 314-324.
STRAIN-ATCC 38531 / Y41;
MEDLINE=97089742; PubMed=8935650;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pohl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Saccharomyces cerevisiae."; FEMS Microbiol. Lett. 137:1-8(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Saccharomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                           PIR; S41937; S41937
                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; X77363; CAA54552.1; -. EMBL; Z71665; CAA96331.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Protein expression during
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Norbeck J., Blomberg A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Feller
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-1278B;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                          165
                                                                                                                                                                                                                                                                                                107
                                                                               306
                                                                                                        196
 289
                                                                                                                                  259
                                                                                                                                                            159
                                                                                                                                                                                       209
                                                                                                                                                                                                                 99
                                                                                                                                                                                                                                                                     42
                                                                                                                                                                                                                                                                                              LVNPGGPGASAVDMV--AAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDA
 STSKEDLIASID-
                          GSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPF 415
                                                                                                          TVSS---
                                                                                                                                  PAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQWVNRYH----
                                                                                                                                                                                     VARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVL------
                                                                                                                                                                                                                 YISPALRELEPEIYKAGITVMNEIGLDPGIDHLYAVKTIDEVHRAGGKLKSFLSYCGGLP
                                                                                                                                                                                                                                          YRRDPMADYSP---
                                                                                                                                                                                                                                                                    LAKPSGSKAISLDVTDDSALDKVLADNDVVISLIPYTFHPNVV----KSAIRTKTDVVTSS
                                                                            -----ALVDPLVQKPGKTSDPRGLSYADATTGTINALYS-PQRWKYLTSGLLGLQR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .
3
                                                                                                                                                                                                                                                                                                                                                                                          biosynthesis; Oxidoreductase; NADP.
CE 446 AA; 48917 MW; 1EC4CE1CE3BCD916 CRC64;
                                                                                                                                                                                                                                                                                                                          ;08
                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (MAY-1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (JAN-1994)
                                                                                                       EDLMATAKPYFIYPGYAF-----VCYPNRDSTLFKDLYHIPEAETVIRGTLR
                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                            ---NPLGY-----KFSWSSRGVLLALRNSAKYWKDGKIE
                                                                                                                                                                                                                                          -AGVT-----HVEQVYRQLAQDCVDRMG---FSFLANIGTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Saccharomyces.
                                                                                                                                                                                                                                                                                                                                     3.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                                                                       37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           exponential
                                                                                                                                                                                                                                                                                                                       Score 99.5; DB
Pred. No. 5.6;
37; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           growth
                                                                                                                                                                                                                                                                                                                                                   DΒ
                                                     NEIFSKPIAWNEALKQYLG-AK
                                                                                                                                                                                                                                                                                                                                                  1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                databases
SKATWKDDEDRERILSGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Saccharomycetales,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FORMING] (EC 1.5.1.10).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0.7
                                                                                                                                                                                                                                                                                                                                                  Length 446;
                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NaCl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL
                                                                                                                                                                                                                                                                                                                         141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       + NADP
NADPH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              medium of
                                                                                                                                                                                     DGAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NADP(+)
                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              commercia.
                                                                                                                                                                                                                 158
                                                                                                                                                            195
                                                                                                                                                                                                                                          208
                                                                               355
                                                                                                        246
                                                                                                                                                                                                                                                                     98
                                                     288
                                                                                                                                  305
                                                                                                                                                                                       258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          way
                                                                                                                                                                                                                                                                                                                         17;
```

```
RESULT 14

SYL_MYCU
ID SYL_W
AC P716;
DT 01-W
DT 01-W
DT 30-W
DT 30-W
DT 30-W
DT ACC
BACL
CG ACCL
CC ACCL
RN [1]
RN [1]
٠ ٥
                                                  Вb
                                                                                 δÃ
                                                                                                                          밁
                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                      INTERPRO; IPRO02302; ...
INTERPRO; IPRO02302; ...
INTERPRO; IPRO02302; ...
INTERPRO; IPRO02302; ...
PFAM; PEO0133; tran-syntl; 1.
PRINTS; PRO0985; TRANSYNTHLEU.
PROSITE; PS00178; AA_TRNA_LIGASE_I; 1.
AMINOACY1-trnA synthetase; Protein biosynthesis; Ligas/WHICAR 80 89 "HIGH" REGION.
SIMILAR 739 743 "KMSKS" REGION.
ATP (BY SIMILARITY).
ATP (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                DR DR FT FT SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                   Query Match
Best Local S
Matches 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SYL_MYCTU
P71698;
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=98295987; PubMed=9634230; Garnier T., Churcher C., Harris Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J. Taylor K., Whitehead S., Barrell B.G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            the European Bioinformatics Institute. There are no restrictions on use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TUBERCULIST;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence.";
Nature 393:537-544(1998).
-i- CATALYTIC ACTIVITY: ATP + L-LEUCINE + TRNA(LEU) = AMP + PYROPHOSPHATE + L-LEUCYL-TRNA(LEU).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
LEUCYL-TRNA SYNTHETASE (EC 6.1.1.4) (LEUCINE--TRNA LIGASE) (LEURS).
LEUS OR RY0041 OR MTCY21D4.04.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -!- SIMILARITY: BELONGS TO CLASS-I AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis.
             143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    319
                                                    54
                                                                                     84
                                                                                                                                                               34
                                                                                                                                                                                                                   Local Similarity
                                                                                                                            N
                                                                                                                                                               TEEPGAGQTPG-----APVVAPQQSWNSCREFIA---DTSEIRTARCATVSVPVDYDQ
                                                                                                                            TESPTAG - - PGGVPRADDADSDVPRYRYTA - - ELAARLERTWQENWARLGTFNVP - - -
                                                  PVGSLAPPDGAAVPDDKLFVQDMFPYPSGEGLHVGHPLGYIA----TDVYARYFRMVG-
                                                                                     PGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAMAPAIADTDI-LRHFDLVGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AWLGLFSDAKITPRGNALDTLCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Z80775; CAB02520.1;
                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RV0041;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSAPRDLCA
                                                                                                                                                                                                                   3.6%;
                                                                                                                                                                                                   49;
                                                                                                                                                                                                                     Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        431
                                                                                                                                                                                                                                        Score 99.5;
                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                     No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        969
                                                                                                                                                                                                                     15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A
                                                                                                                                                                                                                                      DB 1;
                                                                                                                                                                                                 207;
                                                                                                                                                                                                                                      Length 969;
                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium
                                                                                                                                                                                                   189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Harris
                                                                                                                          ż
                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   commercial
                                                                                                                                                               83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .
[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ď.
```

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                  MEDLINE-98295987; pubMed=9634230;
Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Badcock K., Besham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J Taylor S., Whitehead S., Barrell B.G.;
"Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence.";
Nature 393:537-544(1998).
                                                                                          This SWISS-PROT entry is copyright. It is produbetween the Swiss Institute of Bioinformatics the European Bioinformatics Institute. There
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-OCT:1996 (Rel. 34, Created)
15-JUL-1999 (Rel. 38, Last sequence update)
15-JUL-1999 (Rel. 38, Last annotation update)
PROBABLE CATION-TRANSPORTING ATPASE I (EC 3.6.1.-).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium tuberculosis.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CTPI OR RV0107C OR MTCY251.26C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q10900:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CTPI_MYCTU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              478 PLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTL 510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       199
                                                                                                                                                                                          CATALITIC ACTIVITY: ATP + H(2)0 = ADP + ORTHOPHOSPHATE. SUBCELLULAR LOCATION: INTEGRAL MEMBRANE PROTEIN (POTENTIAL). SIMILARITY: BELONGS TO THE CATION TRANSPORT ATPASES FAMILY (E1-E2 ATPASES). STRONGEST SIMILARITY TO EUKARYOTIC CALCIUM-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIV-----EVIAGGNISESA---YTGDGIL 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TGVFLGSYAINPANGEPVPIFIADYVLAGYGTGAIMAV-PGHD-----QRDWDFARAFGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DLVDELVAASWPAG------VNPLWTYG----GGTPGEATAAYRRATAAKSDLERQESREK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPEQVKTMQRNWIGRSTGAVALFSARAASD-DGFEVDIEVFTTRPDTLFGATYLVLAPEH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SPQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHY--SNDQDAFNAVRCVYAP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VTADGRSDRGNFPVFRKRLRQWMMRITA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --RNVLHA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VAEFESGARCLDGGRDWAKLTAGERADVIDEYRLV---YRADSLVN-WCPGLGTVLANEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RLGFGHDSRRSFSTT--DVDFYRWT----QWIFL----QIYNAWFDTTANKARPISEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RMGFSFLANIGTASVARDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----AMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACP-LGTDSA---
                                                                                                                                                                          ATPASES). STRONGEST TRANSPORT SYSTEMS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----PVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -LGFDAFGL-PAEQYAVQTGTHPRTRTEANVVNFRRQLG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacteriaceae; Mycobacterium.
                                                                                                                produced through a c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --YADRLLDDLDVLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Harris
                                                                                                                       collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                  s.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 150
```

use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and for entities requires a license agreement (See http://www.isb-sib.or.send.an.email to license@isb-sib.ch).

restrictions for

outstation

.ch/announce/

```
δõ
                                                 В
                                                                          Qy
                                                                                                      밁
                                                                                                                             ρy
                                                                                                                                                         В
                                                                                                                                                                                  δõ
                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                   Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                           οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 3.6
Best Local Similarity 22.1
Matches 109; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PFAM; PRO0122; EL-b4....
PFAM; PRO0112; CATATPASE.
PRINTS; PRO0119; CATATPASE.
PRINTS; PRO0120; HATPASE.
PROSITE; PS00154; ATPASE_EL_E2; 1.
PROSITE; PS00154; ATPASE_EL_E2; 1.
PROSITE; PS00154; ATPASE_EL_E2; 1.
POTENTIAL.
POTENTIAL.
                                                                                                                                                             1379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
TRANSMEM
                                                  1488
                                                                                                                                                                                                                                                                     1277
                                                                                                                                                                                                                                                                                                                           1231
                                                                                                                                                                                                                1327
                                                                                                      1434 VNLLTDMFPALAVAVTSQFAEPDDAEYPTDDAAERAQREHRRAVLIGPTPSLDA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                 1116 ILAAASALAGSLSSQGDSEW----VVLAEVPFESSRGYAAAIGRVGTDGIPMLMLKGAPE 1171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PFAM; PF00122; E1-E2_ATPase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TUBERCULIST; RV0107C; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERPRO; IPR000695; -.
                                                                                                                                  353
                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                  184 VYRQLAQDCVDRM----GFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTA 239
                                                                                                                                                                                                                                                                                                                                                    124
                                                                                                                                                                                                                                                                                                                                                                                                          70
                                                                                                                                                                                                                                                                                                                                                                                                                                                         23 LLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREETADTSEIRT------
RHSPLVIATALGS 1554
                       YQSGVDLARQLGA 477
                                                 PLLRQI----VNRGVVTAAG----ATAAWAIGRWTPGTERRTATMGLTALVMTQLAQTLLTR 1541
                                                                QRIRQVAPFLSYGQFTGSAPRDLCALWPVP--ATSTPHPAAPAGAGKVVVVVSTTHDPATP 464
                                                                                                                              LQRGSDAGDLLVLA-DDYDGRDADGHYSNDQDAFNAVR-----CVYAPTPADPAAWVAAD 406
                                                                                                                                                       GV-----LLDALVEGRSMWAGVRDAVTILVGGNVGEVLFTVIGTAFGAGRAPVGTRQLLL 1433
                                                                                                                                                                                  WVNRYHALVDPLVQKPGKTSDPR-----GLSYADATTGTINALYSPQRWKYLTSGLLG 352
                                                                                                                                                                                                             ALQRCG-RYTAMVGDGANDAAA-----IRMADVGIGVSGRGSSAARGAADIVLTDDDL 1378
                                                                                                                                                                                                                              YLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQ 299
                                                                                                                                                                                                                                                                                                                        -----HDLELIGY---VGLADTARSSSRPLIEALLDAE-----RNVVLITGDHPIT-ARA 1276
                                                                                                                                                                                                                                                                                                                                                   MAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQ 183
                                                                                                                                                                                                                                                                                                                                                                             TILPRCRLADPGVDHEHAESVVRHLAEQGLRVLAVAQRTWDNGTTHDDETDADAVDAVA- 1230
                                                                                                                                                                                                                                                                                                                                                                                             ---ARCATVSVPVDYDQPGGTQAKLAV--IRVPATGQR-FGALLLVNPGGPGASAVDMYAA 123
                                                                                                                                                                                                                                                                  IARQLGLPADARVVTGAELAVLDEEAHAKLAADMQVFARVSPEQKVQIV------A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IPR001757; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          921
969
997
1401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1432
1547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1053 1053 PHOSPHORYLATION (BY SIMILARITY).
1632 AA; 169606 MW; A29F651A55EF7FD8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1567
1053
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               50
168
197
335
378
657
693
798
941
941
989
1017
1421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3.6%; Score 99; DB
22.1%; Pred. No. 30;
/ative 57; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                POTENTIAL.
POTENTIAL.
POTENTIAL.
POTENTIAL.
POTENTIAL.
POTENTIAL.
POTENTIAL.
POTENTIAL.
POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 1; Length 1632; 30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      235;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                        1487
                                                                                                                                                                                                                                                                  1326
                                                                                                                                                                                                                                                                                                                                                                                                                                                            69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20;
```

Search completed: January 5, 2001, 14:31:12 Job time: 343 sec

÷ •				
		•		
		·		

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tal number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on:
   10
11
12
13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and is derived
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pred. No.
 1286.5
583.5
587.5
529.2
298.5
1128.5
116.5
1112.5
1112.5
1112.5
1112.5
1112.5
1112.5
1112.5
1110.5
110.5
110.5
110.5
110.5
110.5
110.5
110.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               is the number of results predicted by chance to have a ater than or equal to the score of the result being printed rived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4321
   9992
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
11090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1090
1000
1000
1000
1000
1000
1000
1000
1000
1000
1000
1000
1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PIR_66:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            195891 seqs, 67900655 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-461-774-4
2738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              January 5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAMWRRRPLSSALLSFGLLL.....AVMHYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2000000000
 1400
449
274
1815
7576
643
2591
2082
995
1055
1055
383
574
                                                                                                                                                                                                                                                                      DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2001, 14:28:28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gapext 0.5
E70682
T30288
T37056
C83203
F82960
T35114
H70951
H75263
F75356
T46517
                                                                                                                                                                                   JC4184
A70972
E70930
T34992
B70963
B36145
A56716
S73021
T17428
                                                                                                                                                                                                                                                                                                                                                                           T36660
T35966
T34681
T35352
D70968
                                                                                                                                                                                                                                                                                                                                                                                                                                                              C70776
                                                                                                                                                                                                                                                                                                                                         B36944
G82572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ٠.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Search time 67.42 Seconds (without alignments)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              522.700 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            195891
                                                                               probable gamma-glu
pristinamycin I sy
probable multi-dom
probable serine pr
hypothetical prote
probable kinase/ph
                                                                                                                                                                                                                                                                      prolyl aminopeptid
probable DNA polym
hypothetical prote
probable lipoprote
                                               hypothetical prote probable zinc prot
                                                                                                                                                                                                                       aromatic ester
                                                                                                                                                                                                                                     hypothetical prote cobG protein - Pse
                                                                                                                                                                                                                                                                                                                                      proteinase XF2330
                                                                                                                                                                                                                                                                                                                                                                                                                                         probable export pr
probable export pr
proteinase - Strep
                                 serine/threonine
                                                                                                                                                                                   polyketide synthas FK506 polyketide s
                                                                                                                                                                                                                                                                                                                                                                                             probable
                                                                                                                                                                                                                                                                                                                                                                                                            probable secreted
                                                                                                                                                                                                                                                                                                                                                                                                                            probable secreted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Description
               hypothetical prote
                                                                                                                                                                                                                                                                                                                                                         nypothetical
                                                                                                                                                                                                                                                                                                                                                                       ypothetical prote
                                                                                                                                                                                                                                                                                                                                                                                           proteinas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               519
```

ALIGNMENTS

C;Geneti A;Gene: probable export proteinase Rv2223c - Mycobacterium tuberculosis (strain H37RV) C;Species: Mycobacterium tuberculosis C;Species: Mycobacterium tuberculosis C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000 C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000 C;Accession: C70776 R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Hamlin, N.; H;Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; H; RESULT C70776 рь QΥ DЬ Ωy 망 QΥ DЪ γQ Qy A;Status: preliminary; nucleic acid sequence A;Molecule type: DNA A;Residues: 1-520 <COL> Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S. Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; A;Title: Deciphering the biology of Mycobacterium tuberculosis fra;Reference number: A70500; MUID:98295987
A;Accession: C70776 В A;Cross-references: GB:Z70692; GB:AL123456; NID:g3261567; PIDN:CAA94646.1; PID:g12619 A;Experimental source: strain H37Rv Query Match Best Local Sim Matches 516; 242 241 182 181 62 Local Similarity 99.4 nes 516; Conservative 61 N 1 AAMWRRRDLSSALLSFGLLLGGLLLAAPPLAGATEEDGAGQTPGAPVVAPQQSWNSCREF 60 Rv2223c LEREGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQW 300 VEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAY 240 AAMWRRRPLSSALLSFGLLLGGLPLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREF 99.2%; 99.4%; ٠. Score 2717; DB 2; Pred. No. 2.8e-184; 1; Mismatches 2; S.; Seeger, K.; Skelton, S.; Squares, S. not shown; translation Length 520; Indels from the complete 0; not Gaps 61 Holroyd, 0

geno

Дb Ωy

Ş

361 302 301

DLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQ 420

VNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGSDAG

VNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGSDAG

361

밁 Š B Ş В

```
probable export proteinase Rv2224c - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Species: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000
C;Accession: D70776
R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Gordon Yonnor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Holroyd, andream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete genor A;Reference number: A70500; MUID:98295987
A;Accession: D70776
A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Mclecule type: DNA
A;Residues: 1-520 <COL>
A;Cross-references: GB:270692; GB:AL123456; NID:g3261567; PIDN:CAA94647.1; PID:g12619: A;Gene: Rv2224c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
D70776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local 9
                      477
                                                          420
                                                                                                                               360
                                                                                                                                                                   358
                                                                                                                                                                                                       302
                                                                                                                                                                                                                                        305
                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                245
                                                                                                                                                                                                                                                                                                                                                   182
                                                                                                                                                                                                                                                                                                                                                                                                                       123
                                                                                                                                                                                                                                                                                                                                                                                                                                                           125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRCAP
 APLITEDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRC
                                                                                                                                                  DAGD-LLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFL 416 : |: |: |: |: |: 416 | ...
                                                                                                                                                                                                                                                                                                                                                                                                                                        APAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQV 184
                                                                                                                                                                                                                       HALVDPLV------QKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGS
                                                                                                                                                                                                                                                                                               GTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQWVNRY
                                                                                                                                                                                                                                                                                                                                                                  FQTLPKR-VHERFDLVGFDPRGVASSRPAIWCNSDADNDRLRAEPQVDYSREGVAHIENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SYGKFTGDAPLGTCAFWPVPPTSQPHAVSAPGLVPTVVVSTTHDPATPYKAGVDLANQLR
                                                                                        SYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLG 476
                                                                                                                               NRGDTLLALADMYMRRDSHGRYNNSGDARVAINCVDQPPVTDRDKVIDEDRRAREIAPFM
                                                                                                                                                                                                     HSLVDPLVDPDNPRISRPARTKDPRGLSYSDAIVGTIMALYSPNLWQHLTDGLSELV--D
                                                                                                                                                                                                                                                                          PORVRAMILDGAVDPNADPIEAELROAKGFQDAFNNYAADCAKNAGCPLGADPAKAVEVY
                                                                                                                                                                                                                                                                                                                                                   TKQFVGRCVDKMGKNFLAHVGTVNVAKDLDAIRAALGDDKLTYLGYSYGTRIGSAYAEEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEIRTARCATYSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RRDKIARMLLIWAALAAVALV----LVGCIRVVGGRARMAEPKLGQPVEWTPCRSSNPQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLI 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLI 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          47.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1286.5; DB 2; Pred. No. 2.5e-83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PIDN:CAA94647.1; PID:g1261926
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             520;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    64
                                                                                                                                                                                                                                                                                                                304
                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                               419
                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                   244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                        357
                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gordon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                proteinase - Streptomyces coelicolor
C:Species: Streptomyces coelicolor
C:Date: 03-Dec-1999 #sequence_revision 03-Dec-1999 #text
C:Accession: T36660
R:Seeger, K.J.; Harris, D.; Bentley, S.D.; Parkhill, J.
submitted to the EMBL Data Library, March 1999
A:Reference number: Z21611
A;Accession: T36660
A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Residues: 1-539 <SEE>
A;Cross:references: EMBL:AL035636; PIDN:CAB38476.1; GSPI
probable secreted peptidase - Strep
C;Species: Streptomyces coelicolor
C;Date: 03-Dec-1999 #sequence_revis
C;Accession: T35966
                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Experimental source: strain C; Genetics: A; Gene: slpD; SCOEDB: SCH5.02c
                                                                           T35966
                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          р
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 203
                                                                                                                                                534
                                                                                                                                                                                    513
                                                                                                                                                                                                                       474
                                                                                                                                                                                                                                                           454
                                                                                                                                                                                                                                                                                           417
                                                                                                                                                                                                                                                                                                                               400
                                                                                                                                                                                                                                                                                                                                                                  362
                                                                                                                                                                                                                                                                                                                                                                                                    340
                                                                                                                                                                                                                                                                                                                                                                                                                                        302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
nes 203; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17
                                                                                                                                                                                TSLRCA 518
                                                                                                                                                  DGKRCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KLGWRDC ·
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSLLTFDGTQHTVVFQGDSCIDEYVTAYLIGGTTPPSGAKC
                                                                                                                                                . 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                  #sequence_revision
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          28.5%;
                                                    Streptomyces coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A3(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             69;
                  03-Dec-1999 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 520
```

Qy 맑 δÃ 밁 Ş δÃ

В δÃ

엉

Š 밁 δÃ В

ş В

03-bec-1999

```
CARSPACPLG---TDSAQWVNRYHALVDPLVQK--PGKTSDPRGLSYADATTGTINALYS
                                                                                                                                                                                                                                                                                                                                                                                        LTYVGASYGTFLGATYAGLFPDRTGRLVLDGAMDPSLPARRLNLEQTEGFETAFQSFAKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WRRRPLSSALLSFGLLLGGLLLA----APPLAGATEEPGAGQTPGAPVVAPQQ------
                                           VVSTTHDPATPYQSGVDLARQL-GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPP
                                                                                                                       AAWVAADQRIRQVAPFLS----YGQFTGSAPRDL-CALWPVPATSTPHPAAPAGAGKVV
                                                                                                                                                                                       CVKQPDCPLGDKDTTPDQVGKNLKSFFDDLDAKPLPAGDADGRKLTESLATTGVIAAMYD
                                                                                                                                                                                                                                                                                                                                                                                                                                      INYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --TDVTPDDAGETDELVDAYKEFAEGCGADAP--KLLRHVSTVEAARDMDVLRAVLGUEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FRATILTAALLATACSAGGASTSAGSPAAKAAGATEAATATLTP-LPKATPAELSPYYEQ
YVGTTRDPATPYRWAEALSDQLTSGHLLTYEGDGHTAYGRGSSCIDSAINTYLLTGTAPE
                                                                                              AAFSSPDE-VRDALPDFEKASPVFGE--GLAWSSLNCAYWPVKPTGEPHRIEAAGATPIV
                                                                                                                                                                                                                                       PQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PMADYSP--AGVT-HVEQVYRQLAQDC-VDRMGFSFLANIGTASVARDMDMVRQALGDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NPGGPGGSAIGYLQQYAGIGYPAKVRAQYDMVAVDPRGVARSEP-VECLDGREMDAYTR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --SWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT---GQRFGALLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ------GVPGFQCATMKAPLDYAKPADGDVRLAVARKKATGPGKRLGSLLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 780; DB 2;
Pred. No. 1.5e-47;
9; Mismatches 220;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PIDN:CAB38476.1; GSPDB:GN00070; SCOEDB:SCH5.02c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             03-Dec-1999 #text_change 03-Dec-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 539;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Barrell,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      54.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B.G.; Rajandream,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
533
                                                512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       108
                                                                                                473
                                                                                                                                           453
                                                                                                                                                                                            416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       168
                                                                                                                                                                                                                                            399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     52
                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                        284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19;
```

```
probable secreted proteinase - Streptomyces C; Species: Streptomyces coelicolor C; Date: 05-Nov-1999 #sequence_revision 05-No C; Accession: T34681 R; Harris, D; Taylor, K; Parkhill, J; Barr submitted to the EMBL Data Library, May 1998 A; Reference number: Z21553 A; Accession: T34681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R;Seeger, K.J.; Harris, D.; Bentley, S.D.; Parkhill, J.; Barrell, B.G.; Rajandream, M.A. submitted to the EMBL Data Library, January 1999
A;Reference number: Z21551
A;Accession: T35966
A;Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вр
                                                    A; Experimental source: strain C; Genetics:
                                                                   A;Cross-references: EMBL:AL023517; PIDN:CAA18977.1; GSPDB:GN00070; SCOEDB:SC1B5.03c A;Experimental source: strain A3(2)
                                                                                                  A; Molecule type: DNA
A; Residues: 1-543 < HAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-references: EMBL:AL035161; PIDN:CAA22727.1; GSPDB:GN00070; SCOEDB:SC9C7.15c A;Experimental source: strain A3(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-529 <SEE>
                                    A; Gene:
                                                                                                                                     A; Status: preliminary; translated from GB/EMBL/DDB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Gene: SCOEDB:SC9C7.15c
                                                                                                                                                                                                                                                                                                                                                                       442
                                                                                                                                                                                                                                                                                                                                                                                                        468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 53 YPTLQCASLEVPLDHARPRGRRITLALSRVPHTAGTYQGPLLVNPGGPGGSGLTLAGFVA
                                    SCOEDB: SC1B5.03c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ν
                                                                                                                                                                                                                                                                                                                                                                     GYAAHRLLRDSALVVEEGGGNHGITLSGNDCLDEHLAAYLTDGTVP
                                                                                                                                                                                                                                                                                                                                                                                                      GVDLARQL--GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLP 511
                                                                                                                                                                                                                                                                                                                                                                                                                                         DLYEKAPEMVWNNAWYNAP---CAFWPT-GSGQPVDVANGELPPVLLFQATGDAATPYEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDSAQWVNRYHALVDPLVQKP--GKTSDPRGLSYADATTGTINALYSP-----QRWKYLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YAKLHPDRVRRLVLDSVVGPDDVWYDANLNQ----DLAFNDRHRAFLAWIAEHDAAYGLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFND----YAADCARSPACPLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QANLARAESFADACGEKYADVLPYIDTVDAARDVDAIRAALGAEKLNYFGYSYGTYLGAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QVYRQLAQDCVDRMGFSF---LANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SSLPA----RVAAQYDVIGFDPRGVGRSTPALDC-LPGHFDPVRPDSLPD---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVE 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RQRAAVLCGAAVIAAGTVTAVP--ADASAPRPAHPAPVAP--AAGLHWEKCA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EAFASYAKDEDTGPLVEAYENFGALDASG--DNGYSVYTAVQCRDAAWPRDWDEWRDDSW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SDPERVEAAWYAMRTALAKRPAGGKV----GASELEDT-----YMPGGYYNGYWPYLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT-GQRFGALLVNPGGPGASAVDM---VA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 583.5; DB 2; Pred. No. 1.1e-33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                           05-Nov-1999 #text_change
                                                                                                                                                                                          Barrell, B.G.; Rajandream, 1998
                                                                                                                                                                                                                                                                               coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                       487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --TPDVE
                                                                                                                                                                                                                                             24-Nov-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -TED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Db
                                  망
                                                                                                                                                                                          A; Experimental source: strain C; Genetics:
A; Gene: SCOEDB: SC5H1.36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                 20
                                                                                                                                                                                                                                           A;Molecule type: DNA
A;Residues: 1-543 <OLI>
A;Cross-references: EMBL:AL049863; PIDN:CAB42961.1;
                                                                                                                                                                                                                                                                                          A;Reference number: Z21575
A;Accession: T35352
A;Status; preliminary; translated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЪ
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 178; Conserv
                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                513 AYLLDGRLPARDTSCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10
 65
                                  12
                                                                   6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
SEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAM 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HYFLDGTLPPTSLRCAP 519
                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20.0%;
```

```
probable proteinase - Streptomyces coelicolor
C;Species: Streptomyces coelicolor
C;Date: 05-Nov-1999 #sequence_revision 05-Nov-1999 #text_change 24-Nov-1999
C;Accession: T35352
R;Oliver, K.; Harris, D.; James, K.D.; Parkhill, J.; submitted to the EMBL Data Library, May 1999
A;Reference number: Z21575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PGGPGASAVDM-VAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEF----&: 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APAGAGKVVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TINALYSPORWKYLTSGLLGLORGSDAGDLLVLADDYDGRDADG - - HYSNDQDAFNAVRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPI--EESISQMAGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMV 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGGPGASGLYFPLVGMVPEW--KRIAAAYDLVGYAPRGVAPSAP-LSCQDPGDFFKGPRP 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PD-----GIRCGTVTVPLDYAHPDGKQVRLTVSRVRATHRDPDGGGREVPGQ--GALLYN 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT-------GQRFGALLVN 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAALYSAAGSLLLATILTAAPVRAAPPAGPGPAEALGTAVAARRAAAGVDFGRCPQAEEL 72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SSALLS-FGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQS-----WNSC--REFI 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PP----TLYLAAERDAATPYEGALELRRRLAGSVLVTERDAGTHGIAGGPNACVNGHLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NDAPWPADFEVWDRDNTRLARRAPFETWDNVWTNLP---CAYWQGPRQRPLDVRTAPGEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALW-----PVPATSTPHPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YYDD-YWPHRAEALSAYL------KGDPQPLVDQAGTRTAEGAVRSENSNAVYTAVEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EDRWDDFKEWVAEHDAVYGLGDTARQVQDSYEEASARLAAEPAGGTVGPAQFQGAFLTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QTAFNDYAADCARSPAC-PLGTDSAQWVNRYHALVDPLVQKP-GKTSDPRGLSYADATTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RAALGERRLTFMGASYGTYLGALYAELFPSHVRRMVFDAVVNPDPEQVWYRNNLDQSEAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----AEAY---ARDCAKR-GGEALRHYHSLNNARDLEVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 547.5; D. Pred. No. 3.8e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 2;
                                                                   Barrell,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                   B.G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  87;
                                                                Rajandream,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24;
```

```
RRCAVTGALGLALLGAGLPAAASGATTATTRDTGSGL---SRFYDQRVEWTACE----GT
                          RRPLSSALLSFGLLLGGLLLAAPPLAGA-TEEPGAGQTPGAPVVAPQQSWNSCREFIADT
                                                                      19.3%; Score 29.2%; Pred.
                                                          Mismatches
                                                        e 529; DB 2; I
. No. 7.7e-30;
ismatches 227;
                                                                                    Length 543;
                                                        Indels
                                                          100;
                                                        Gaps
 64
                             64
                                                           19;
```

from

GB/EMBL/DDBC

GSPDB:GN00070; SCOEDB:SC5H1

. 36

```
A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Molecule type: DNA A;Rosidues: 1-528 <COL> A;Cross-references: GB:Z80225; GB:AL123456; NID:g3242265; PIDN:CAB02326.1; PID:e266414; A;Experimental source: strain H37Rv C;Genetics: A;Gene: Rv2672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          hypothetical protein Rv2672 - Mycobacterium tuberculosis (strain H37RV)
c;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 22-Oct-1999
C;Accession: D70968
R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.;
Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Hc
Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S.
Nature 393, 537-544, 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
D70968
                                                                                                          Ωy
                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. Title: Deciphering the biology of Mycobacterium tuberculosis from the complete feference number: A70500; MUID:98295987
Accession: D70968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                      Ş
                                                                 밁
                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                            Query Match
Best Local Sin
Matches 142;
                        100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                125
                                                                    99
                                                                                                             49
                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65
                                                                                                                                                        9
                    GQREGALLVNPGGPGASAVDMVAAMAPAIADTDILRHEDLVGFDPRGVGHSTPALRCRTD 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FDGNQCVDSAVMHYFLDGTLPPTSLRCAP 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DDPDRPTAAQVTASLDRLRARYEDVSPVFGRYRLTQVLMCYGRPRGTDYIRDDVKDL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AYLERFGTHVRAMVLDGAIDPAVSPI-EESISQMAGFQTAFNDYAADCARSPACPLGTDS
                                                                 APKNDLSWHDCTSRVYSNAGIPAAPGVKLECASYDTDLDPLVGGSTAVSIGVVRARSNQT
                                                                                                          APQQ--SWNSCREFIADTSEIRTA----RCATVSVPVDYDQPGGTQAKLAVIRVPA--T
                                                                                                                                                        RPMTSTAMLVALTCSATVLAACVPAFGADPRFATYSGAGPQGAATTTPPPPAGP---PPLA 65
                                                                                                                                                                                                 YASSKCVHRKVDDFLLYGSLPPDGSSCGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLITFD--GTQHTAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YAPTPADPAAWVAADQRIR----QVAP-----FLSYGQFTGS----APRDLCAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QLLEDGDTRGLEGESSGGVTFPVRAAVNAPVRGDRTAGLTDEEDVPMDNLPAALMAINCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----TSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQD-----AFNAVRCV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RDARDQVERLVASL-----DSDPVPSAFGEPFTGQDMVGAIGQALYSRELWPSLERALA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTI-----NALYSPQRWKYL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VYAARFPDKVGRMVLDG-VDTLTEPLAEQGLAGARGQQTALENFLDWCVEDVACPFGQDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --VLERLRDAAAECAKYSG-PVLPHIGTVDAARDMDVMRRALGDDRLNYLGFSYGTRLGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \verb|THVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGT|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKEF--MHLTNGYDVVTFDPRGVGRSSPVSCGPATLKIMEATDGDGGMTDPEG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APAIADTDILRHFDLVGFDPRGVGHSTP-----ALRCRTDAEFDAYRRDPMADYSPAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMPKDLQCGKVTVPLDYSRPRGGTLDVALARYRATGDSRGSVLLNFGGPGGSGINELALG
  --
                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --DTARMLLVGTRGDPATPYRWTTETADRLGPSAVVLDNRGEGHTG-
                                                                                                                                                                                                                                            10.9%; Score 298.5; DB 2; 25.1%; Pred. No. 1.4e-13; tive 72; Mismatches 250;
  --
<del>:</del>
_
_
_
_
_
_
_
_
                                                                                                                                                                                                                                              Indels 101;
                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                         528;
                                                                                                             99
                                                                 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               346
                                                                                                                                                                                                                                              26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gordon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ເນ
```

```
QΥ
                                                                                                                                                                                                                                                                                                                                                                              C;Genetics:
A;Gene: ompP
C;Keywords: membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
A; Residues: 1-226 <KAU>
A; Cross-references: GB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Title: New outer membrane-associated protease A;Reference number: A36944; MUID:94117370 A;Accession: B36944 A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    hypothetical protein (ompP 3' region) - Escherichia coli (fragment) c;Species: Escherichia coli (fragment) C;Date: 07-Jul-1995 #sequence_revision 07-Jul-1995 #text_change 19-Oct-1995 C;Bate: 07-Jul-1995 #sequence_revision 07-Jul-1995 #text_change 19-Oct-1995 C;Baccession: B36944; S37474
                                                                       В
                                                                                                        Qy
                                                                                                                                             В
                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R; Kaufmann, A.; Stierhof, Y.D.; J. Bacteriol. 176, 359-367, 1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
187
                                                                       139
                                   211
                                                                                                           151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                             85
                                                                                                                                                                                 95
                                                                                                                                                                                                                                                       47
                                                                                                                                                                                                                   25
                                                                                                                                                                                                                                              VVAPQQSWNSC-----KLAVI 94
                                                                                                         TPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVA
YDIERIRQALGDKQLTAVAYSYGTQIAALYAERFPSSIRS
                                  RDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRA
                                                                                                                                             KLPAKSKRKGSVIIISGGPGLPGIN-----PYINFDWPVTNLRESWDIIGFDPRGVGQS
                                                                                                                                                                                                                   VSARQIEWQSCMTSPYSDWFGKESSSPELLCGYLSVPLKYTDTGKDVSDENIPLVRLAMT 84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GFQTAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTG
                                                                                                                                                                              RVPATGQREGALLVNPGGPGASAVDMVAAMAPAI - - - - ADTDILRHEDLVGFDPRGVGHS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PHPAAPAGAGKVVVVSTTHDPATPYQSGVDLARQLGAPLITFDGTQHTAVFDG.....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VN-----RPTP-----DRVRELVVAWGKLYPQFGAVAALNLVKCVHW--PSSSSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TINALYSPORWKY-LTSGLLGLORGSDAGDLLVL----ADDYDGRDADGHY-SNDQDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMA 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ---DHFDRDEMRDQAQFQAGDDPVANLSDISNTATTDCTDAIAPGESAYDNTHAAS---D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        YSSCAVPPLVAYLDTGKLPDTDTYC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -NQCVDSAVMHYFLDGTLPPTSLRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PQPPKDLKV-DVLLLGVQNDPIV----GNEGVAATAATAINANAASKRVMWQGIGHGASI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FNAVRCVYAPTPADPAAWVAADQRIRQ~-VAPFLSYGQFTGSAPRDL--CALWPVPATST 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VATALGFPDSGRVDSTTKLADALAAARSGDMNLLSALINRAD--TTRDTDGQFISSCSDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GQQAALDAFAAQCV-AVNCALGSHP-----KGAVSALLSAARSGDGPGGASVAAVANA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IERLRKLWDVPALAFVGIGNGTQVALAYAASRPDNVARLILDSPIALGVSAEAAAEQQVQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AEFDAYRRDPMADYS--PAG---VTHVEQVYRQLAQDCVDRM--GFSFLANIGTASVARD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PSDAGPLVFTTGSDLPSSTQLPVWLAH--AGIDVLRSHPIVAVDRRGMGMSSP-IDCR--
                                                                                                                                                                                                                                                                                           64;
                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                         GB: X74278
                                                                                                                                                                                                                                                                                                                                                                                  protein
                                                                       NQERLVNVSE---
                                                                                                                                                                                                                                                                                                            9.9%;
29.1%;
                                                                                                                                                                                                                                                                                           43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Henning,
                                                                                                                                                                                                                                                                                                            Score 271;
Pred. No. 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          517
                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         □
                                                                     KQLILQKINACIHNTGAEVIRHIGSHEAV
                                                                                                                                                                                                                                                                                                            4e-12;
                                                                                                                                                                                                                                                                                                                           DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                           79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Escherichia coli K-12.
                                   250
226
                                                                                                                                                                                                                                                                                                                           Length 226;
                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                       3A
                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                             138
                                                                       186
                                                                                                         210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                234
                                                                                                                                                                                                                                                                                           6
```

RESULT

```
A;Cross-references: GB:AE004043; GB:AE003849; NID:g9107486; PIDN:AAF85129.1; GSPDB:GN0001 A;Experimental source: strain 9a5c R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; As-Neto, E.; Benno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H. as-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. phintted to GenBank, June 2000 Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frohm D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigrenathors: Martins, E.M.F.; Matskuma, A.Y.; Mancho, C.L.; Marques, M.V.; Martins, E. A. Authors: Martins, E.M.F.; Matskuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C.Y.; F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.A. Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak A.; Authors: da Silva, A.C.R.; da Silva, R.G.; Santelli, R.V.; Sawasak A.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L.; A., Reference number; A59328
                                        Ş
                                                                                                 밁
                                                                                                                                            Ş
                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Title: The genome sequence of the plant pathogen Xylella fastidiosa A; Reference number: A82515; MUID:20365717
A; Note: for a complete list of authors see reference number A59328 being the complete list of authors.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C:Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000 C:Accession: G82572 R:anonymous, The Xylella fastidiosa Consortium of the Organization for Nuclean Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Contents: annotation C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proteinase XF2330 [imported] -
C; Species: Xylella fastidiosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Gene: XF2330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: DNA
A; Residues: 1-526 <SIM>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Accession: G82572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 140
     442
                                                  441
                                                                                                                                                 394
                                                                                                                                                                                                 334
                                                                                                                                                                                                                                              351
                                                                                                                                                                                                                                                                                              292
                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                                          237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                              LGLQRG-SDAGDLLVLADDYDGRDADGHYS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VTHVEQVYRQLAQDCVDRM-GFSFLANIGTASVARDMDMVRQALGDDQINVLGYSYGTKL
                                               PHPAAPAGAGKVVVVSTTHDPATP----YQSGVDLARQLGAPLITFDGTQHTAVFDGN
                                                                                                                                                                                                                                                                                                                                                                                        AQHYARRYRAHVRTLTMDGVV-----PNDLVIGSEFATTFENAIALQDAQCRKDPSCAKR
                                                                                                                                                                                                                                                                                                                                                                                                                    GTAYLERFGTHVRAMVLDGAIDPAVSPIEESI-SQMA-GFQTAFNDYAADCARSPAC---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TGVVAAVAPSL -- NEVRKKRDIFFVDQRGTGGSHP-LTC-VDAQGRAFQLE-----AE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GHIRVL-CAQLPVLENPALPEGRRITLKIAWLERDSGSHPASDPVF----FIAGGPGQSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RMLKKYWIVLALIVVGGVFVYFPTRVAASSFEASSAATLQPVVRSYGRLRFEPCILSARGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAP--QQSWNSCREFIADT
  ----LPA-----GQGHGTIRVG-
                                                                                                                                            PTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDL----CALWP------VPATST
                                                                                                                                                                                              VSLAFGLSYAPELIALLPLILNEAASGHYAPLMSLSQLVGLGMDDQMNHALQWAVICT--
                                                                                                                                                                                                                                                                                              FPI--DSRQQLR-----TLMERLRQGSE---VEYQDPASGEM----RRRITADTV
                                                                                                                                                                                                                                                                                                                                        -PLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NTTTPEQYIAFVQRCAASLQGRADPRYYTTTEAVTDLDMYRTALSVDKINLIGVSYGTRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEIRTARCATVSVPVDYDQPGGTQAKLAVIRV-----PATGQRFGALLVNPGGPGASA 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9.5%; Score 261; DB 2; 25.3%; Pred. No. 6.1e-11; rative 76; Mismatches 217;
                                                                                               -ANAGAGGALFGSEVAQMFFTPCKVWPTGIRPPDFMMPLVSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Xylella fastidiosa (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           reference number A59328 below
                                                                                                                                                                                                                                              ----NDQDAFN----AVRCVYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 526;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Organization for Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels 120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9a5c)
                                                                                                                                            440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    176
                                                                                               441
                                                                                                                                                                                                                                                                                           333
                                                                                                                                                                                                                                                                                                                                                                                                                                        291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequer
                                                                                                                                                                                                                                                                                         Вþ
                                        δÃ
                                                                                            뮹
                                                                                                                                                                                         В
                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                      Db
                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
밁
                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
301
                                                                                                                                                                                              219
```

```
A;Residues.
A;Cross-references: DDBJ:DJV/1-, ....
A;Cross-references: DDBJ:DJV/1-, ....
A;Accession: PC4051
A;Accession: PC4051
A;Molecule type: protein
A:Residues: 2-23;88-105;166-213;239-253;317-350;376-401
A:Residues: 2-23;88-250;476-401
A:Residues: 2-23;88-210;476-401
A:Residues: 2-23;88-2105;476-401
A:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     prolyl aminopeptidase (EC 3.4.11.5) - Aeromonas sobria N;Alternate names: Pro-X aminopeptidase; proline aminopeptidase; proline im C;Species: Aeromonas sobria C;Date: 31-Aug-1995 #sequence_revision 27-Oct-1995 #text_change 20-Jnn-2000 C;Accession: JC4184; PC4051; I39543 R;Kitazono, A.; Kitano, A.; Tsuru, D.; Yoshimoto, T. J. Biochem. 116, 818-825, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Gene: pap
C;Superfamily: prolyl aminopeptidase
C;Keywords: alpha-aminoacylpeptide hydrolase
F;2-425/Product: prolyl aminopeptidase #statu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Title: Isolation and characterization of the A; Reference number: I39543; MUID:95189781 A; Accession: I39543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Title: Isolation and characterization of the prolyl aminopeptidase A; Reference number: {\tt JC4184} A; Accession: {\tt JC4184}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  e activities.
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: GB:D30714; NID:g604877; PID:g604878 C;Comment: This enzyme is widely distributed in nature,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-385 < RES>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Status: preliminary; translated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local S
Matches 85
                                                                                                                                                                                  248
                                                                                                                                                                                                                                                                   103
                                                                                                                                                                                                                                                                                                                                                       189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                          LAHLNPRQQADYLSHFRADSIVRDAELIREQLSPDHPWSLLGQSFGGFCSLTYLSLFPDS
                                                                                                                                                                                                                                                                                                                                                                                                                                            WIKRALQEFRVLLLDQRGTGHSTP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DI----LRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQL 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TVPLDHQQPDDEETITLFGRTLCRKDRLDDELPWLLYLQGGPG:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SVPVDYDQPGGTQAKLAVIRVPATGQRFGA----LLVNPGGPGASAVDMVAAMAPAIADT 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QCVDSAVMHYFLD
SAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRG
                                                                                         LHEVYLTG----GVAPIGRSADEVYRATYQRVADKNRAFFARFPHAQAIANRLATHLQRII
                                                                                                                                                                     VRAMVLDGAIDPAVSPIEESISQM--AGFQTAFNDYAADCARSP-----
                                                                                                                                                                                                                                                                                                                                              AQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQ-INYLGYSYGTKLGTAYLERFGTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1-425 <KIT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         prolyl aminopeptidase #status
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DDBJ:D30714; NID:g604877; PIDN:BAA06380.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4.7%;
22.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 128.5;
Pred. No. 0.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in nature,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            prolyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aminopeptidase; prolline iminopeptida
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2;
                                                                                                                                                                                                                                                                                                                                                                                                                                        -----IHAEL 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----FGAPRPSANGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aminopeptidase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              it catalyzes the pemoval
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <MAT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           113;
                                                                                                                                                                              -ACPLGTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PID 11236731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                              162
                                                                                                                                                                                                                                                                                                                                                   247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             73
    356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (pap)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (pap)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       of.
```

QRIRQVAPFLSYGQ-----FTG
:|:| | |:: | |||
ERVRGEFPALAWAQGKDFAFTG

SDAGDLLVLADDYDGRDADGHYSNDQDA---FNA----VRCVYAPTPADPAAWVAAD 406

-QGLDL - -GASGAFEELY -

252

-LEDAFIGEKLNPAFLYQVQAMQPFNTNPVFAILHELIYCEGAA--SHWAA--

300

DVRLPNGQRLTVEQLQQ-----

```
RESULT 12
E70930
hypothetical protein Rv1796 - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 22-Oct-1999
C;Accession: E70930
                                                                                                                                                                                                                                                                                        ρy
                                                                                                                                                                         밁
                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A:Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete A;Reference number: A70500; MUID:98295987
A;Accession: A70972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       probable DNA polymerase III alpha chain - Mycobacterium tuberculosis (strain
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R;Cole, S.T.; Brosch, R.; Connor, R.; Davies, R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-1079 <COL>
Pross-references: GB: AL009198; GB: AL123456;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Status: preliminary; nucleic acid sequence not shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ;Superfamily: DNA-directed DNA polymerase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Accession: A70972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               xperimental source: strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          753
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Sin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     57 CREFIADTSEIRTAR------CATVSVPVDYDQPG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11
                                                                                                                                                                                                                GVDLA 472
                                                                                                                                                                         ELELA
                                                                                                                                                                                                                                                     QVEALATAGALGCF-GMSRRE--ALWAAGAAATGRPDRLPGVG-----SSSHIPALPGMS
                                                                                                                                                                                                                                                                                              RIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVVSTTHDPATPYQS
                                                                                                                                                                                                                                                                                                                                          GLGAVRYLGAELAEKLVAE - - - -
                                                                                                                                                                                                                                                                                                                                                                               GL----QRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQ
                                                                                                                                                                                                                                                                                                                                                                                                                            SPQSLVADARRHGVAVHGPCV-----NASLAHATCENAG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SAQWV---NRYH--ALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APDEVIDRIYEKLEAFANFGFPESHALSFASLVFYSAWFKLHHPAAFCAALLRAQPMGFY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AIDPAVSPIEESISQMAGF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPA-----GVTHVEQVYRQLAQDCVDR 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GIEVDLA--RLDLSEPAVYEMLARADSVGVFQVESRAQMATLPRLKPRVFYDLVVEVALI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAMA--PAIADT---DILRHFDLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDRPIADVCPVEWARMANRSVLQWDKDDCAAIGL-VKFDLLGLGMLSALHYAKDLVAEHK 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RPGPIQGGSVHPYIRRRNGVDPVIYEHPSMA---PALRKTLGVPLFQEQLMQLAVDCA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                         949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -AAEADQLRRAMGSKR------STERMRRLRGRFYDGMRA--LHG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; F. J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4.3%;
23.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 51;
                                                                                                                                                                                                                                                                                                                                          -RTANGPFTSLPDLTSRVQ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 119;
Pred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                III alpha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----QTAFNDYAADCAR-SPACPLGTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NID: g3242262;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 175;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 1079;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    chain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 146;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PIDN:CAA15755.1; PID:g26616
                                                                                                                                                                                                                                                                                                                                                                                                                          ----TEVRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                467
                                                                                                                                                                                                                                                       944
                                                                                                                                                                                                                                                                                                                                                                                 407
                                                                                                                                                                                                                                                                                                                                                                                                                        851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              658
                                                                                                                                                                                                                                                                                                                                       892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           713
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        s, D.; Gordon,
N.; Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H37RV)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ß
```

Rajandream,

576 T

576

13

A; Molecule type: DNA A; Residues: 1-447 <OLI>

A; Cross-references:

source:

EMBL:AL031182; ce: strain A3(2)

PIDN:CAA20169.1; GSPDB:GN00070; SCOEDB:SC4A2.17c

A; Status: preliminary; translated

from

GB/EMBL/DDBJ

```
Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the comple A;Reference number: A70500; MUID:98295987
A;Recession: E70930
A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Molecule type: DNA
A;Residues: 1-585 <COL>
                                                                           δÃ
                                                                                                                                                       Qy
                                       밁
                                                                                                                   Ъ
                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                 멍
                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Cross-references: GB:AL022021; GB:AL123456; NID:g3250699; PIDN:CAA17717.1; PID:e125A;Experimental source: strain H37Rv C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                   431
463 T 463
                                       536
                                                                                                                                                                                                                                                                                   373
                                                                                                                                                                                                                                                                                                                                                               343
                                                                                                                   481
                                                                                                                                                           356
                                                                                                                                                                                                                                         304
                                                                                                                                                                                                                                                                                                                                                                                                       195
                                                                                                                                                                                                                                                                                                                                                                                                                                             283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           194 VIPAPP-----PEEGVPPGAPVPGPEPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24 LLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVSVPVDYDQ
                                                                           VAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPA 462
                                                                                                                                                                                                                                                                               CKQNPIFDPLQPDDPRAWNAVTTVVTPSWFHDYVLTVGAVDANGQPLSKMSI-AGPWVS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PGGTQAKLAVIRVPA-TGQRFGALLVNPGGPGASA-----VDMVAAMAPAIADTDIL 134
                                                                                                                                                                                                                                                                                                                       GAIDPAVSPIEESISQMAGFQTA-----FNDY-----AADCARSPACPLGTDSAQWVNR 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVD 194
                                       LSAPLVVPQ---
                                                                                                                   AKFPELSAYQIINRLIHTARPPARGVD-----NQVGYGVVDPVAALTWDVPKGPAEPPKQ
                                                                                                                                                                                                                                       YHALVDPLVQKPGKTSDPRGLSYAD----ATTGTINALYSPQRWKY---LTSGLLGLQR
                                                                                                                                                                                                                                                                                                                                                             QRALG--AAVHYAAVDKDAVIV-AAAGD-----GSK-----KD
                                                                                                                                                                                                                                                                                                                                                                                                     RMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLD
                                                                                                                                                                                                                                                                                                                                                                                                                                             QSSQAFGLKDPYTGDEDPQTAQKIDNVETMARAIVHAANMGASVINISDVMCMSARNVID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGGT-----VTVPSYSGGRKIAPIDNPRNPHPSAPSPALGPPPDAFSGIAPGVEIISIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      104;
                                                                                                                                                                                                   -----ISAPG--TDVVGLSPRDDGLINAIDGPDNSLLVPAGTSFSAAIVSGVAALVR
                                                                                                                                                           ---DAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPT-----PADPAAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4.3%;
21.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 116.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        187;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----PAPGPQPPAVDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels 139;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hamlin, N.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                         402
                                                                                                                                                                                                                                                                               43C
                                       575
                                                                                                                                                                                                 480
                                                                                                                                                                                                                                       355
                                                                                                                                                                                                                                                                                                                                                               372
                                                                                                                                                                                                                                                                                                                                                                                                     254
                                                                                                                                                                                                                                                                                                                                                                                                                                           342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gordon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        geno
```

```
RESULT 14
B70963
hypothetical protein Rv0236c - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 28-Jul-2000
C;Accession: B70963
R;Cole, S:T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Hamris, D.;
; Connor, R.; Davles, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Ho
Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S.
Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G.
A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complet
A;Reference number: A70500; MUID:98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Geneti
A;Gene:
                                                                                                   δÃ
                                                                                                                                          Вр
                                                                                                                                                                                                                                                                                                A:Experimental source: strain H37Rv
C:Genetics:
A;Gene: Rv0236c
C:Superfamily: Mycobacterium leprae probable integral membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
"~+~hes 70; Conserva
                             δÃ
                                                                     뫄
                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                           Status: preliminary; nucleic acid sequence not shown; Molecule type: DNA (COL) Residues: 1-1400 <COL>; Cross.references: GB:Z92669; GB:AL123456; NID:g3242271; Cross.references: GB:Z92669; GB:AL123456; NID:g3242271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ;Genetics:
;Gene: SCOEDB:SC4A2.17c
                                                                                                                                                                                                                                  Query Match
Best Local Similarity
639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          346
                                                                                                                                            557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               292 PLGTDSAQWVNRYHALVDPL-----VQKPGKTSDPRG-LSYADATTGTINALYSPQRWKY 345
                                                                                                        54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             96
                                                                                                                                                                              œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DTNHYLLTMT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PAATDTEPRSAAGNGATTPLASTTPVPVPAGTAPGTGRLPFASATTAGLHNTYSPTAFRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LAQGL-----DTGTGMIEIDTWPDNTTKQWKVSHSHPHRNVNNCTPATTAAQLYSGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LTSGLLGLQRGSDAGDLLVLADDY-DGRDADGHYSNDQDAFNAVRCVYAPTPA-----
                                 PGASAVDMVAAMAP----AIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD 168
                                                                                                                                                                            PLSSALLSFGLLLGGLLLAAPPLAGATEEPG------AGQTPGAPVVAPQQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AVMHYFLDGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APAGAGKVVVVSTTH-----DPATPYQSGVDLARQLGAPLITFDGTQHTAVFDGNQCVDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PADLLPKPTGGSYATASDAARADNWPTRSELAGRVLLYAIPGSHTPHPDIELGRHLRDLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HSNLETCLDDVRIWLRAHPGAGPLVVKLELKAGFAT-GQGMGPSQLDTLIAAHLGDMVFR
PVLMTADARAAGLPVPQVAVTDTPVARETDYGRVD---
                                                                                                       WNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAV-IRVPATGQRFGALLVNPGG
                                                                                                                                            PGLAKLAEFGAPVG-----PDPLAGFVNDSGLRPRYPAIEIYRVSAPANPGAP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ATGNIGRAQVFPAVHGATAGDPRTAYK---DTA--IRPWFVVFDG-DATTYLDGLNTTWY
                                                                                                                                                                                                                 136;
                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -DPAAWVAADQ-----RIRQVAPFLSYGQFTGSA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4.2%;
                                                                                                                                                                                                                                  4.2%;
20.7%;
                                                                                                                                                                                                                                                                                                                                                                             GB:AL123456; NID:g3242271;
                                                                                                                                                                                                               58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23;
                                                                                                                                                                                                                                Score 114; DB Pred. No. 5.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 115;
Pred. No. 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -WP----
                                                                       VD---
                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                     -GGPEVLLRLDERRRLQGQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----VPATSTPHP----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 2;
.99;
                                                                                                                                                                                                                                                   DB 2;
                                                                                                                                                                                                                 242;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    111;
--HHSSAIRAPGDAR-HTYNRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Whitehead, S.; Barrell, B.G. tuberculosis from the complete
                                                                                                                                                                                                                                                   Length 1400;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 447;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels 106;
                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                 translation
                                                                                                                                                                                                                                                                                                                                                                               PIDN:CAB07017.1;
                                                                                                                                                                                                                 220;
                                                                                                                                                                                                                                                                                                       protein
                                                                       -PPLG
                                                                                                                                                                                                                                                                                                                                                                                                                                   not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             155
692
                                                                                                                                          604
                                                                                                                                                                              53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          397
                                                                                                                                                                                                                                                                                                                                                                               PID: g3242273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15;
                                                                                                                                                                                                                 33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gordon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ß
```

```
C;Species: Pseudomonas sp.
C;Date: 30-Nov-1990 #sequence_revision 13-Jan-1993 #text_change 08-Oct-1999
C;Accession: B36145
R;Crouzet, J.; Cameron, B.; Cauchois, L.; Rigault, S.; Rouyez, M.C.; Blanch, J. Bacteriol. 172, 5980-5990, 1990
A;Title: Genetic and sequence analysis of an 8.7-kilobase Pseudomonas denit. A;Reference number: A36145; MUID:91008976
A;Accession: B36145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
B36145
                    Š
                                                        В
                                                                                       Qy
                                                                                                                             В
                                                                                                                                                           QΥ
                                                                                                                                                                                                    В
                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                           뮹
                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross-references: GB:M59301;
A;Note: the source is designate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: DNA
A; Residues: 1-459 < CRO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cobG protein - Pseudomonas sp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1092 ARNRARALTVDCDHGPVVAVAGRFVHTSI-----RTTVGALLDGE-PVAALPC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1032
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      871
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              811
                    254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                169
                                                                                                                                                                                                                                                                            106 GLAIEVPPLAGIDPDEIADPRPIA-----TELREAL-DVRQVPLKLAPKLSVVIDS 155
                                                                                                                                                                                                                                                                                                               22 GLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVSVPVDY 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15
WVAADQRIRQVAP - - - FLSYGQFT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IAGW-----DLGSELLGRPGCAPGPDGVRCAASMALAPEEPANLSRTLTVPRPVSVTPMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PMADYSPAGVTHVEQVYR----QLAQDCVDRMGFSFLANIGTASVARDMD----MVRQAL
                                                      GLGLAF-AQVEAAALASYLHQV-QALGANAIRLAPGHAF
                                                                                                                             SLGTTMRGRDLDPSEIRALCRCETSSE----RPAAPRSAA----IPGIHALGNADTVL
                                                                                                                                                             LVGFDPRG----VGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVD 194
                                                                                                                                                                                                                                     DQPGGTQAKLAVIRVPATGQRFG-ALLVNPGGPG--ASAVDMVAAMAPAIADTDILRHFD 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVDLARQL-----GAPLITEDGT-QHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GELTTLWLHPRVTDTVSVSLLDWDDVIDRNALGFDQLKPPGLAEVVVLSAGGAPIAPADA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -DLCALWPVP-ATSTPHPA------APAGAGKVVVVSTTHDPATPYQS 467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WTAPQRVVQHKTPPTLTLTLPRPTVVTGLRLAASRSMLPAHPTVVAINLGDGPQVRQLQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPA A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SAQWVNRYHALVDPLVQKPGKTSDPRGL----SYADATTGTIN--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LPYGETPWVRFTAAATDDGSAGVQFGITDLAITQYDASGFAHPVQLRHTVLVPGPPPGSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                I------ADCARSPACPLGTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QAAVGQWLQVDFDRPVTNAVVTLTPSATAVGAQVRRILIETVNGSTTLRFDEAGKPLTAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GDDQINYLGYSYGTKLGTAYL-----ERFGTHVRAMVLDGA------IDPAVSPIEES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P--DYPVPGAEPVVGGWTGGRITVSSSSADATAMPDVAPASAPAAAVDGDPATAWVSNAL
                                                                                         RMGFSFLANIGTASVARDMDMVRQALGDDQINYL-GYSYGTKLGTAYLERFGTHVRAMVL
                                                                                                                                                                                                    GGRFGLGAVVADIRLQAVSTVAGVAWVLSLGGTSTKASSVGTLAGNAVVPALITILEKLA
                                                                                                                                                                                                                                                                                                                                                   89; Conserv
                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -VRPRQGPKLADLI----
                                                                                                                                                                                                                                                                                                                                                                                                                                        3:M59301; GB:M32224; NID:g151170; PIDN:AAA25795.1; designated as Pseudomonas denitrificans
                                                                                                                                                                                                                                                                                                                                                                    4.1%;
                                                                                                                                                                                                                                                                                                                                                   49;
                                                                                                                                                                                                                                                                                                                                                 Score 113.5; I
Pred. No. 1.3;
49; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -AAPSTTRASGDSDLVDILGSAYAAADGDPATA
                                                                                                                                                                                                                                                                                                                                                                                     DΒ
                                                                                                                                                                                                                                                                                                                                                   152;
                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -GSAPR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -ALYSPQR 342
                                                      ---FVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            517
                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Blanche,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       denitrificans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . 870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      925
                    310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          267
                                                        305
                                                                                            253
                                                                                                                              265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  296
                                                                                                                                                                                                                                                                                                                                                                                                                                                           PID:g151172
                                                                                                                                                                                                                                                                                                                                                   20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ŧ
.
```

ջ

protein -

Sequence:

Perfect score:

Scoring table:

Sequence

2, Appli 5, Appli 6, Appli 10, Appli 11, Appli 11, Appli 11, Appli 10, Appli 35, Appli 35, Appli 5, Appli 5, Appli 5, Appli 5, Appli 7, Appli

```
tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Issued_Patents_AA:*
1: /cgn2_6/ptodata/2,
2: /cgn2_6/ptodata/2,
3: /cgn2_6/ptodata/2,
4: /cgn2_6/ptodata/2,
5: /cgn2_6/ptodata/2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-09-461-774-4
2738
1 AAMWRRRPLSSALLSFGLLL.....AVMHYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               January 5, 2001, 14:27:16; Search time 45.19 Seconds (without alignments) 206.234 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     174772 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/cCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20000000000
   Match 0%
Match 100%
first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GenCore version (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17957048 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gapext 0
           US-08-173-508-8
US-08-265-310-8
US-08-265-310-6
US-08-265-310-6
US-08-265-310-2
US-08-265-310-2
US-08-265-310-2
US-08-804-227C-9
US-08-804-227C-9
US-08-804-198-3
US-08-804-198-1
US-08-804-199-11
US-08-804-227C-4
US-08-611-107-31
US-08-804-227C-4
US-08-804-227C-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ws
                                                                                                                                                                                                                                                                                                                                                                                                  SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Compugen
Sequence
                                                                                                                                                                                                                                                                                                                                                           Description
8 Appli
8 Appli
6 Appli
6 Appli
6 Appli
6 Appli
6 Appli
7 Appli
8 Appli
8 Appli
8 Appli
9 Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    519
 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 1
US-08-173-508-8
                                                                                       ; MOLECULE TYPE: US-08-173-508-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 8, Patent No.
                                                                                                                                                                                                                                                              CIP: 20007-5109
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/173,508
FILING DATE: 23-DEC-1993
CLASSIFICATION: 435
CLASSIFICATION: 435
CLASSIFICATION: 435
                         Query Match
Best Local Similarity
Matches 203; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: Hadary, Dany
APPLICANT: Jenish, David
APPLICANT: Liedger Timothy
TITLE OF INVENTION: STREPTOMYCES P.
TITLE OF INVENTION: STREPTOMYCES STRILE OF INVENTION: POLYPEPTIDES
NUMBER OF SEQUENCES: 13
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 1874
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
                                                                                                                                               TELEX: 904136
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                            STREET:
CITY: Wa
                                                                                                              TYPE: ami
TOPOLOGY:
                                                                                                                                                                         TELEPHONE: 202 672 5399
                                                                                                                                    LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE:
 4 WRRRPLSSALLSFGLLLGGLLLA----APPLAGATEEPGAGQTPGAPVVAPQQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                            Washington, D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5616485
                                                                                                                       f: 539 amino acids amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Application US/08173508
                                                                                                                                                                                                                                                                                                                                                                                                                       3000 K Street,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Butler, Michae
Hadary, Dany
Jenish, David
                                                                                                                                                                                                                                                                                                                                                                                                  USA
                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bartfeld, Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                    Foley & Lardner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3011
4928
1298
1298
5588
5588
584
1164
4164
622
638
638
3170
3170
3170
3170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Michael J.
                                    28.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                       Z.W.
                                                                                                                                                             8:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-710-637-2

PCT-US93-00907-2

US-09-036-987A-6

US-08-690-473-2

US-08-690-473-2

US-08-729-416C-17

US-08-589-756-1

US-08-589-756-1

US-08-426-819A-36

US-08-426-819A-36

US-08-426-125-5

US-08-426-125-5

US-08-426-125-5

US-08-439-039A-5

US-08-439-039A-5

US-08-439-039A-5

US-08-680-326-37

US-08-680-326-37
                         69;
                                      Score
Pred.
                                                                                                                                                                                                                         18740/125/CACO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ALIGNMENTS
                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROTEASES AND IMPROVED STRAINS FOR EXPRESSION OF PEPTIDES
                                    780; DB 1;
No. 2e-64;
                         220;
                                                1;
                                                                                                                                                                                                                                                                                                                         #1.25
                                                Length 539;
                         Indels
```

Result No.

Score

Query Match

Gaps

19

Post-processing: Minimum
Maximum

Listing

Minimum

Maximum

DB DB

seq

length:

```
ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-265-310-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 8, Application US/08265310 Patent No. 5856166
                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                      APPLICANT:
APPLICANT:
APPLICANT:
                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                     CORRESPONDENCE ADDRESS:
ADDRESSEE: Foley & Lardner
STREET: 3000 K Street, N.W.
CITY: Washington, D.C.
                                                                                                                                                                                                                      APPLICANT: Garven, Shelia TITLE OF INVENTION: STREPT TITLE OF INVENTION: STREPT TITLE OF INVENTION: POLYPE POLYPE OLYPE STREPT STREET STREPT STREET ST
                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   242 LTYVGASYGTFLGATYAGLFPDRTGRLVLDGAMDPSLPARRLNLEQTEGFETAFQSFAKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 169
APPLICATION NUMBER: US/0 FILING DATE: 24-JUN-1994
                                                                                                                                             COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DGKRCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TSLRCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CVKQPDCPLGDKDTTPDQVGKNLKSFFDDLDAKPLPAGDADGRKLTESLATTGVIAAMYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CARSPACPLG---TDSAQWVNRYHALVDPLVQK--PGKTSDPRGLSYADATTGTINALYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --TDVTPDDAGETDELVDAYKEFAEGCGADAP--KLLRHVSTVEAARDMDVLRAVLGDEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VVGTTRDPATPYRWAEALSDQLTSGHLLTYEGDGHTAYGRGSSCIDSAINTYLLTGTAPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VVSTTHDPATPYQSGVDLARQL-GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAWVAADQRIRQVAPFLS----YGQFTGSAPRDL-CALWPVPATSTPHPAAPAGAGKVVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EGAWQQLRESLTSAIKEKDGAGLLILSDSYYEREADGGYSNLMFANAAVNCLDL----P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PMADYSP--AGVT-HVEQVYRQLAQDC-VDRMGFSFLANIGTASVARDMDMVRQALGDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAFSSPDE-VRDALPDFEKASPVFGE--GLAWSSLNCAYWPVKPTGEPHRIEAAGATPIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NPGGPGGSAIGYLQQYAGIGYPAKVRAQYDMVAVDPRGVARSEP-VECLDGREMDAYTR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KLGWRDC-----GVPGFQCATMKAPLDYAKPADGDVRLAVARKKATGPGKRLGSLLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --SWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT--GQRFGALLV
                                                                                                                              20007-5109
                                                                                                                                             USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               518
                                                                                                                                                                                                                                                                                                                                     Malek, Lawrence T. Soostmeyer, Gisela
                                                                                                                                                                                                                                                                                                                                                                                  Hadary, Dany
Jenish, David
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  539
                                                                                                                                                                                                                                                                                                                        Walczyk, Eva
                                                                                                                                                                                                                                                                                                                                                                    Krieger,
                                                                                                                                                                                                                                                                                                                                                                                                                 Butler,
                                                                                                                                                                                                                                                                                                       Krygsman, Phyllis
                                                                                                                                                                                                                                                                                                                                                                                                                   Bartfeld, Daniel Butler, Michael J.
                                                                                                                                                                                                                                        STREPTOMYCES
STREPTOMYCES
POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                      Timothy
                US/08/265,310
                                                                                                                                                                                                                                                                       PROTEASES AND IMPROVED
                                                                                                                                                                                                                                                        STRAINS FOR EXPRESSION OF PEPTIDES
                                              Version
                                                #_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          75
                                                                                                                                                                                                                                                       AND
```

```
US-08-951742-8

US-08-951742-8

Sequence 8, Application US/08951742

Patent No. 6127144

GENERAL INFORMATION:
APPLICANT: Bartfeld, Daniel

APPLICANT: Bartfeld, Daniel
                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; MOLECULE T
US-08-265-310-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: US 08/173
APPLICATION NUMBER: US 08/173
ATTORNEY/AGENT INFORMATION:
NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 1874(
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
TELEFAX: 202 672 5399
TELEX: 904136
INFORMATION FOR SEQ ID NO: 8:
SEQUENCE CHARACTERISTICS:
LENGTH: 539 antino acids
TEVER: Bellow Sold
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity Matches 203; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                 474
                                                                                                                                                                                                                                                                  454
                                                                                                                                                                                                                                                                                                        417
                                                                                                                                                                                                                                                                                                                                           400
                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 534 DGKRCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4 WRRRPLSSALLSFGLLLGGLLLA----APPLAGATEEPGAGQTPGAPVVAPQQ------
                                                                                                                                                                                          TSLRCA 518
                                                                                                                                                                                                                                                                                                                             AAWVAADQRIRQVAPFLS----YGQFTGSAPRDL-CALWPVPATSTPHPAAPAGAGKVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --TDVTPDDAGETDELVDAYKEFAEGCGADAP--KLLRHVSTVEAARDMDVLRAVLGDEK
                                                                                                                                                                                                                             VVGTTRDPATPYRWAEALSDQLTSGHLLTYEGDGHTAYGRGSSCIDSAINTYLLTGTAPE
                                                                                                                                                                                                                                                                  VVSTTHDPATPYQSGVDLARQL-GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPP
                                                                                                                                                                                                                                                                                                        AAFSSPDE-VRDALPDFEKASPVFGE--GLAWSSLNCAYWPVKPTGEPHRIEAAGATPIV
                                                                                                                                                                                                                                                                                                                                                                               EGAWQQLRESLTSAIKEKDGAGLLILSDSYYEREADGGYSNLMFANAAVNCLDL-----P
                                                                                                                                                                                                                                                                                                                                                                                                                PQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADP 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                         CVKQPDCPLGDKDTTPDQVGKNLKSFFDDLDAKPLPAGDADGRKLTESLATTGVIAAMYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CARSPACPLG---TDSAQWVNRYHALVDPLVQK--PGKTSDPRGLSYADATTGTINALYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LTYVGASYGTFLGATYAGLFPDRTGRLVLDGAMDPSLPARRLNLEQTEGFETAFQSFAKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PMADYSP--AGVT-HVEQVYRQLAQDC-VDRMGFSFLANIGTASVARDMDMVRQALGDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NPGGPGGSATGYLQQYAGTGYPAKVRAQYDMVAVDPRGVARSEP-VECLDGREMDAYTR- 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KLGWRDC-----GVPGFQCATMKAPLDYAKPADGDVRLAVARKKATGPGKRLGSLLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --SWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT--GQRFGALLV 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FRATLLTAALLATACSAGGASTSAGSPAAKAAGATEAATATLTP-LPKATPAELSPYYEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28.5%; Score 780; DB 2 37.2%; Pred. No. 2e-64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      69; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                08/173,508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .8740/133/CACO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      220;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                           453
                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    284
```

19;

APPLICANT:

Bartfeld, I Michael J.

Butler

APPLICANT:

Dany Hadary

```
ρy
                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                    Q
                 δÃ
                                                      망
                                                                                   Qγ
                                                                                                                     밁
                                                                                                                                                  γ
                                                                                                                                                                                       В
                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; TOPOLOGY: linear; MOLECULE TYPE: protein US-08-951-742-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEX: 904136
INFORMATION FOR SEQ ID NO: 8:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 0189740/0140
TELECOMMUNICATION INFORMATION:
TELEPHONE: (202)672-3300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
NAME: Bent, Stephen A.
REGISTRATION NUMBER: 29,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE CHARACTERISTICS:
LENGTH: 539 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
ADDRESSEE: Foley & Lardner
STREET: 3000 K Street, N.W., Suite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Sheila Garven
TITLE OF INVENTION: METHOD FOR EXPRESSION OF
TITLE OF INVENTION: BACTERIAL HOST CELLS
NUMBER OF SEQUENCES: 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CURRENT APPLICATION DATA:
                   340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                      302
                                                                                                                      242
                                                                                                                                                       225
                                                                                                                                                                                         186
                                                                                                                                                                                                                        169
                                                                                                                                                                                                                                                         128
                                                                                                                                                                                                                                                                                         109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release
                                                                                                                                                                                                                                                                                                                                          53 --SWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT--GQRFGALLV 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: US/08/951,742 FILING DATE: 16-OCT-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CITY: Washington
                                                                                                                                                                                                                                                                                                                      76 KLGWRDC-----GVPGFQCATMKAPLDYAKPADGDVRLAVARKKATGPGKRLGSLLV
                                                                                                                                                                                                                                                                                                                                                                                         17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH:
CVKQPDCPLGDKDTTPDQVGKNLKSFFDDLDAKPLPAGDADGRKLTESLATTGVIAAMYD
                                                                                                                                                                                                                                                                           NPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD 168
                                                                                                                                                                                                                                                                                                                                                                                       FRATLLTAALLATACSAGGASTSAGSPAAKAAGATEAATATLTP-LPKATPAELSPYYEQ
                                                                                                                                                                                                                                                                                                                                                                                                                      WRRRPLSSALLSFGLLLGGLLLA----APPLAGATEEPGAGQTPGAPVVAPQQ------
                                                                                   CARSPACPLG---TDSAQWVNRYHALVDPLVQK--PGKTSDPRGLSYADATTGTINALYS 339
                                                                                                                     LTYVGASYGTFLGATYAGLFPDRTGRLVLDGAMDPSLPARRLNLEQTEGFETAFQSFAKD
                                                                                                                                                                                     --TDVTPDDAGETDELVDAYKEFAEGCGADAP--KLLRHVSTVEAARDMDVLRAVLGDEK
                                                                                                                                                                                                                     PMADYSP--AGVT-HVEQVYRQLAQDC-VDRMGFSFLANIGTASVARDMDMVRQALGDDQ
                                                                                                                                                    INYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAAD
                                                                                                                                                                                                                                                      NPGGPGGSAIGYLQQYAGIGYPAKVRAQYDMVAVDPRGVARSEP-VECLDGREMDAYTR- 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (202)672-5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eva Walczyk
Phyllis Krygsman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gisela Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lawrence T. Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Tim Krieger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            David
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Jenish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         28.5%;
37.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 780; DB 3; Pred. No. 2e-64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       500
                                                                                                                                                                                                                                                                                                                                                                                                                                                         220;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 539;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                        54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                     241
                                                  361
                                                                                                                                                                                                                                                                                                                                                                                     75
                                                                                                                     301
                                                                                                                                                                                                                     224
                                                                                                                                                                                                                                                                                                                      127
                                                                                                                                                      284
                                                                                                                                                                                                                                                                                                                                                                                                                      52
```

19;

밁

65

SDDAPAPDGDWRCATLKAPLDWSDPDGETIDLALIRSRASGDDRIGSLLFNFGGPGASGV 124

```
δÃ
                                 DЪ
                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                         ; MOLECULE TYPE: US-08-173-508-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-08-173-508-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                           Query Match
Best Local Sim
Matches 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 6, Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                         REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 18/
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,
                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION DATA:
APPLICATION NUMBER: US,
FILING DATE: 23-DEC-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
LENGTH: 513 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CITY: Wa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             534 DGKRCS 539
                                                                                                                                                                                                               LENGTH: 513 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0,
   65
                                 10
                                                                18
                                                                                                                                                                                                      TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                       CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ≥ 6, AFF
NO. 5616485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VVSTTHDPATPYQSGVDLARQL-GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGT1.PP 512
                                                              LLLGGLLLAAPPLAGATEE-----PGAGQTPGAPVVAPQQS--WNSCREFIADT 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TSLRCA 518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EGAWQQLRESLTSAIKEKDGAGLLILSDSYYEREADGGYSNLMFANAAVNCLDL-----P 416
SEIRTA----RCATVSVPVDYDQPGGTQAKLAVIRVPATG-QRFGALLVNPGGPGASAV 118
                                 LTAAAALLTAGCSGGSSDEDKDDGGRSSAGPSAAAPSGYPEALASQTLDWARC-----EG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VVGTTRDPATPYRWAEALSDQLTSGHLLTYEGDGHTAYGRGSSCIDSAINTYLLTGTAPE 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAFSSPDE-VRDALPDFEKASPVFGE--GLAWSSLNCAYWPVKPTGEPHRIEAAGATPIV 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAWVAADQRIRQVAPFLS-----YGQFTGSAPRDL-CALWPVPATSTPHPAAPAGAGKVV 453
                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Washington, D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Application US/08173508
                                                                                                                                                                                                                                                                              904136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3000 K Street,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Butler,
Hadary,
                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jenish, David
                                                                                                                                                                                                       linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bartfeld, Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Foley & Lardner
                                                                                                                                                                                     protein
                                                                                                                                                                                                                                                                                                                                                                                                                     23-DEC-1993
                                                                                                           23.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Dany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Michael J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREPTOMYCES
STREPTOMYCES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Timothy
                                                                                                                                                                                                                                                                                                                                                                                                                                       US/08/173,508
                                                                                                                                                                                                                                                                 6:
                                                                                              69;
                                                                                           Score 653.5; DB 1;
Pred. No. 1.2e-52;
i9; Mismatches 224;
                                                                                                                                                                                                                                                                                                                                           L8740/125/CACO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROTEASES AND IMPROVED STRAINS FOR EXPRESSION OF PEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Version
                                                                                                                          Length
                                                                                                                           513;
                                                                                              61;
                                                                                           Gaps
                                 64
                                                                                              18;
```

```
RESULT 5
US-08-265-310-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 6, Application US/08265310 Patent No. 5856166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 18740/133/CACO
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202 672 5300
                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                                                                                    APPLICATION NUMBER: US 08/173,508 FILING DATE: 23-DEC-1993 ATTORNEY/AGENT INFORMATION:
                                                                                                                                       APPLICATION NUMBER: US/08/265,310
FILING DATE: 24-JUN-1994
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               125
                                                                                                                                                                                                                                                                                                                                                   STREET: 3000 K St.
                                                                                                                                                                                                                                                                                                                                        COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RRMADELGKDVGVVLTWQGEGHGAYGNGSDCVDSAVDAYLLKGTVPKDGKVCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCV---YAPTPADPAAWVAADQR 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LGTDSAQWVNRYHALVDPLVQKPGKTSDP-RGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTELGGVYAHLFPEHVGRVILDAVVDPGADTMGHAENQARGFQRALDDYLESTGQEP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STM----PSYADTVSSLHERYDLVSWDPRGVA-ASEGVRCRTDEAIEAAESVDSTPDSPA 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DMVAAMAPAIADT--DILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPA 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEKVSPV--FGAFLGWDTAGWCHDWPVAGQHETAEVSAPDAAPVLVVGNTGDPATPYEGA 460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSG 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAEEG-DGSELLALADGYNERDPSGRYGTTTHSQRVISCLDDKQRPTVEETKKLL----PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----EEQAYLKDAADFGRGCEKAAG-KLMEHVSTTDTARDMDLMRHVLGDERMHYFGISY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVTHVEQVYRQLAQD----CVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----EQGSRKIAGLLERLDAEPLPTSSPGRELTQTLAFTGIVLPLYSESGWPALTSALK
                                                                                                                                                                                                                                                                                                                        20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hadary, Dany
Jenish, David
Krieger, Timothy
Malek, Lawrence T.
Soostmeyer, Gisela
                                                                                                                                                                                                                                                                                                                                                                       E: Foley & Lardner
3000 K Street, N.W.
                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Krygsman, Phyllis
Garven, Shelia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Walczyk, Eva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Butler, Michael J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bartfeld,
                                                                                                                                                                                                                                                                                                                                                                                                                                           STREPTOMYCES
STREPTOMYCES
POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                        D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                                           PROTEASES AND IMPROVED STRAINS FOR EXPRESSION OF PEPTIDES
                                                                                                                                                                                                                                 Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       291
                                                                                                                                                                                                                                                                                                                                                                                                                                                             AND
```

STREET: CITY:

N W ,

Suite 500

```
Š
                                                                                                                                                                                                                                                                                                                                US-08-951-742-6
                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; MOLECULE TYPE: protein US-08-265-310-6
                                                                                                                                                                                                                                         Sequence 6, Application US/08951742
Patent No. 6127144
GENERAL INFORMATION:
APPLICANT: Bartfeld, Daniel
APPLICANT: Michael J. Butler
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Sim Matches 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INFORMATION FOR SEQ ID NO: (
SEQUENCE CHARACTERISTICS:
LENGTH: 513 amino acids
TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                                                                           APPLICANT:
                                                                                                                                       APPLICANT:
                                                                                                                                                                         APPLICANT:
                                                                   TITLE OF INVENTION: METHOD FOR TITLE OF INVENTION: BACTERIAL H
                                 CORRESPONDENCE ADDRESS:
                                                     NUMBER OF SEQUENCES:
                                                                                                     APPLICANT:
                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                      461
                                                                                                                                                                                                                                                                                                                                                                                                                                        469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               352 GLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCV---YAPTPADPAAWVAADQR 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                180
ADDRESSEE: Foley & Lardner STREET: 3000 K Street, N.W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18 LLLGGLLLAAPPLAGATEE------PGAGQTPGAPVVAPQQS--WNSCREFIADT
                                                                                                                                                                                                                                                                                                                                                                                                  RRMADELGKDVGVVLTWQGEGHGAYGNGSDCVDSAVDAYLLKGTVPKDGKVCS
                                                                                                                                                                                                                                                                                                                                                                                                                                 VDLARQLG---APLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRCA 518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LGTDSAQWVNRYHALVDPLVQKPGKTSDP-RGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DMVAAMAPAIADT--DILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPA 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEKVSPV--FGAFLGWDTAGWCHDWPVAGQHETAEVSAPDAAPVLVVGNTGDPATPYEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVVSTTHDPATPYQSG 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAEEG-DGSELLALADGYNERDPSGRYGTTTHSQRVISCLDDKQRPTVEETKKLL---PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----EQGSRKIAGLLERLDAEPLPTSSPGRELTQTLAFTGIVLPLYSESGWPALTSALK 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTELGGVYAHLFPEHVGRVILDAVVDPGADTMGHAENQARGFQRALDDYLESTGQEP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----EEQAYLKDAADFGRGCEKAAG-KLMEHVSTTDTARDMDLMRHVLGDERMHYFGISY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GVTHVEQVYRQLAQD----CVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSY 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STM----PSYADTVSSLHERYDLVSWDPRGVA-ASEGVRCRTDEAIEAAESVDSTPDSPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SDDAPAPDGDWRCATLKAPLDWSDPDGETIDLALIRSRASGDDRIGSLLFNFGGPGASGV 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEIRTA-----RCATVSVPVDYDQPGGTQAKLAVIRVPATG-QRFGALLVNPGGPGASAV 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LTAAAALLTAGCSGGSSDEDKDDGGRSSAGPSAAAPSGVPEALASQTLDWARC-----EG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                     Phyllis Krygsman
Sheila Garven
                                                                                                                                                     Gisela Soostmeyer
                                                                                                                                       Eva Walczyk
                                                                                                                                                                         Lawrence T. Malek
                                                                                                                                                                                       Tim Krieger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                             David Jenish
                                                                                                                                                                                                                             Dany Hadary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23.9%;
                                                   25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        s; Score 653.5; DB 2;
s; Pred. No. 1.2e-52;
69; Mismatches 224;
                                                                   HOST CELLS
                                                                                     PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61;
                                                                                                                                                                                                                                                                                                                                                                                                      513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         18;
```

```
US-08-173-508-2

; Sequence 2, Application US/08173508

; Patent No. 5616485
                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-951-742-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME: Bent, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 0189
RELECOMMUNICATION INFORMATION:
TELEPHONE: (202)672-5300
TELEPHONE: (202)672-5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE: 16-OCT-1997
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELLEFAX: \_TELEFAX: \
                                                                                                                                                                                                                                                                           469
                                                                                                                                                                                                                                                                                                                                             403
                                                                                                                                                                                                                                                                                                                                                                                                           409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH: 513 amino acids TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STATE: D.C.
                                                                                                                                                                                                     RRMADELGKDVGVVLTWQGEGHGAYGNGSDCVDSAVDAYLLKGTVPKDGKVCS
                                                                                                                                                                                                                                            FEKVSPV--FGAFLGWDTAGWCHDWPVAGQHETAEVSAPDAAPVLVVGNTGDPATPYEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCV---YAPTPADPAAWVAADQR 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STM----PSYADTVSSLHERYDLVSWDPRGVA-ASEGVRCRTDEAIEAAESVDSTPDSPA 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DMVAAMAPAIADT -- DILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPA 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEIRTA-----RCATVSVPVDXDQPGGTQAKLAVIRVPATG-QRFGALLVNPGGPGASAV 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LTAAAALLTAGCSGGSSDEDKDDGGRSSAGPSAAAPSGVPEALASQTLDWARC-----EG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LLLGGLLLAAPPLAGATEE-----PGAGQTPGAPVVAPQQS--WNSCREFIADT 64
                                                                                                                                                                                                                                                                                                                                                                                                        IRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSG 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAEEG-DGSELLALADGYNERDPSGRYGTTTHSQRVISCLDDKQRPTVEETKKLL---PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTELGGVYAHLFPEHVGRVILDAVVDPGADTMGHAENQARGFQRALDDYLESTGQEP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----EEQAYLKDAADFGRGCEKAAG-KLMEHVSTTDTARDMDLMRHVLGDERMHYFGISY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVTHVEQVYRQLAQD----CVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSY 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SDDAPAPDGDWRCATLKAPLDWSDPDGETIDLALIRSRASGDDRIGSLLFNFGGPGASGV 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----EQGSRKIAGLLERLDAEPLPTSSPGRELTQTLAFTGIVLPLYSESGWPALTSALK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LGTDSAQWVNRYHALVDPLVQKPGKTSDP-RGLSYADATTGTINALYSPQRWKYLTSGLL 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          UMBER: US/08/951,742
16-OCT-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 653.5; DB 3;
Pred. No. 1.2e-52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0189740/0140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               234
```

18;

```
Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                               οy
                                                                                                                                      В
                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QУ
                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; MOLECULE TYPE: US-08-173-508-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 173; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
APPLICANT: Bartfe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 537 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Krieger, TITLE OF INVENTION: TITLE OF INVENTION: TITLE OF INVENTION: INVENTIO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATTORNEY/AGENT INFORMATION:
NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: PatentIn Release #1.0, Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELECOMMUNICATION INFORMATION: TELEPHONE: 202 672 5300
TELEFAX: 202 672 5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
354
                                                                      329
                                                                                                                                                                                                                                                                                                                                                               220
                                                                                                                                                                                                                                                                                                                                                                                                                                     176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       102
                                                                                                                                                                                                                                                                                        234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: PatentIn Release #1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: US/0 FILING DATE: 23-DEC-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET: 3000 K Street, CITY: Washington, D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEX: 904136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60 ARAARAGIDWEDC----AADWNLPKPIQCGYVTVPMDYAKPYGKQIRLAVDRIGNTGTRSE 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE:
                                                                                                                                                                                                                                                                                                                             LGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPI--EESISQMAGFQTA 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EF-DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQA 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REGALLVNPGGPGASAVDMVAAMAPAIAD-TDILRHFDLVGFDPRGVGHSTPALRCKTDA 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RKSSIRRRATAFG--TAGALVTATLIAGAVSAPAASAAPADGHGHGRSWDREARGAAIAA 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTP------GAPVVA 49
SAWAPTAEIFS----KYV----
                                                               ATTGTINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDY--DGRDADGHYS--NDQDA 384
                                                                                                                                                                                                             FNDYAA-DCARSPACPLGTDSAQWVNRYHALVDPLVQKP-GKTSDPRGL-----SYAD 328
                                                                                                                                                                                                                                                                                                                                                                                                                              EFVKAPKADPVPG-SEADKRAQRKLAREYAEGCFERSG-EMLPHMTTPNTARDLDVIRAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RQGALIYNPGGPGGSGLRFPARVTNKSAVWANTAKAYDFVGFDPRGVGHSAP-ISCVDPQ 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PQQS-----WNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATG---Q 101
                                                                                                                                      WKDWQDWVAANDAAYHLGDTRAEVQDQWLKLRAAAAKKPLGGVVGPAELISFFQSAPYYD
                                                                                                                                                                                                                                                                                        LGEKKLNYLGVSYGTYLGAVYGTLFPDHVRRMVVDSVVNPSRDKIWYQANLDQDVAFEGR 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       E: Foley & Lardner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Krieger, Timothy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Jenish, David
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hadary, Dany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Butler, Michael J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bartfeld, Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STREPTOMYCES PROTEASES AND IMPROVED STREPTOMYCES STRAINS FOR EXPRESSION POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20.8%; score 570.5; DB 1; 31.1%; Pred. No. 6.9e-45; tive 82; Mismatches 233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/08/173,508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <u>ب</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18740/125/CACO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAINS FOR EXPRESSION OF PEPTIDES AND
-AGDTQALVDAAAPDLSDTAGNASAENGNAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indel:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                          353
                                                                                                                                                                                                                                                                                                                                                                                                                                  233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21;
```

```
4 QY
                                                                                                               ; MOLECULE TYPE: protein US-08-265-310-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γΩ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-265-310-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 2, Application Patent No. 5856166 GENERAL INFORMATION:
                               Query Match 20.8
Best Local Similarity 31.1
Matches 173; Conservative
                                                                                                                                                                                                            TELEX: 904136
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                             SEQUENCE CHARACTERISTICS:
LENGTH: 537 amino acids
                                                                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: US 08/173,508 FILING DATE: 23-DEC-1993 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                       TELEPHONE: 202 672 5300
                                                                                                                                                                                                                                                                                                                                                                                                                                                     CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                       TELEPHONE: 202 f
                                                                                                                                                                                                                                                                                                                                                                                      PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       515 TYLLTGRTDARDVTCAP 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0,
                                                                                                                                                TOPOLOGY:
                                                                                                                                                                                                                                                                                       NAME: BENT, Stephen A.
REGISTRATION NUMBER: 29,768
REFERENCE/DOCKET NUMBER: 18
                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: FILING DATE: 24-JU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE:
   5 RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  YTAVECTDAKWPANWRTWDRDNTRLHRDHPFMTWANAWMNLP---CATWPVKQQTPLNVK 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HYFLDGTLPPTSLRCAP 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APAGAGKVVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM 502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPA 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TGKGLPPVLIVQSERDAATPYEGAVELHQRFRGSRLITERDAGSHGVTGLVNPCINDRVD 514
                                                                                                                                                            amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Washington, D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20007-5109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Application US/08265310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 E: Foley & Lardner 3000 K Street, N.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Krygsman, Phyl.
Garven, Shelia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Krieger, Timothy
Malek, Lawrence T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jenish, David
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Walczyk, Eva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Soostmeyer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hadary,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Butler, Michael J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bartfeld,
                                                                                                                                                                                                                                          672 5399
                                                                                                                                                                                                                                                                                                                                                                                                                       24-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREPTOMYCES
STREPTOMYCES
POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Dany
                                                 20.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Phyllis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                      US/08/265,310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gisela
                                                                                                                                                                                                              <u>ب</u>
                                  82;
                                                                                                                                                                                                                                                                                         18740/133/CACO
                               Score 570.5; DB 2;
Pred. No. 6.9e-45;
2; Mismatches 233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROTEASES AND IMPROVED STRAINS FOR EXPRESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Version #1.25
   -----GAPVVA 49
                                 Indels
                                                                Length
                                                                537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OF PEPTIDES
                                  69;
                                 Gaps
                                  21;
```

```
Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-951-742-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/08951742 Patent No. 6127144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
              SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA: APPLICATION NUMBER: US/08/951,742
                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: PC-DOS/MS-DOS
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: APPLICANT:
                                                                                                                                                                                                                                                                     TITLE OF INVENTION:
                                                                                                                                                                                                                                      CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                503 HYFLDGTLPPTSLRCAP 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       161 EF-DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQA 21.9
                                                                                                                                                                                 STREET: 3000 K S
CITY: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             50
                                                                                                                                     ZIP: 20007-5109
                                                                                                                                                 COUNTRY:
                                                                                                                                                                      STATE:
 FILING DATE:
                                                                                                                                                                                                                    ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ENAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPA 444
: || | | | || : : : ||::: : | || || : : :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYLLTGRTDARDVTCAP 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGKGLPPVLIVQSERDAATPYEGAVELHQRFRGSRLITERDAGSHGVTGLVNPCINDRVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APAGAGKYVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM 502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YTAVECTDAKWPANWRTWDRDNTRLHRDHPFMTWANAWMNLP---CATWPVKQQTPLNVK 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SAWAPTAEIFS----KYV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATTGTINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDY--DGRDADGHYS--NDQDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WKDWQDWVAANDAAYHLGDTRAEVQDQWLKLRAAAAKKPLGGVVGPAELISFFQSAPYYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FNDYAA-DCARSPACPLGTDSAQWVNRYHALVDPLVQKP-GKTSDPRGL-----SYAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPI--EESISQMAGFQTA 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EFVKAPKADPVPG-SEADKRAQRKLAREYAEGCFERSG-EMLPHMTTPNTARDLDVIRAA 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RQGALIYNPGGPGGSGLRFPARVTNKSAVWANTAKAYDFVGFDPRGVGHSAP-ISCVDPQ 1755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RFGALLVNPGGPGASAVDMVAAMAPAIAD-TDILRHFDLVGFDPRGVGHSTPALRCRTDA 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ARAARAGIDWEDC---AADWNLPKPIQCGYVTVPMDYAKPYGKQIRLAVDRIGNTGTRSE 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PQQS-----WNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATG---Q 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RKSSIRRRATAFG--TAGALVTATLIAGAVSAPAASAAPADGHGHGRSWDREAKGAAIAA
                                                                                                                                                                     D.C.
                                                                                                                                                                                                    E: Foley & Lardner
3000 K Street, N.W
                                                                                                                                                   USA
                                                                                                                                                                                                                                                                                                       Sheila Garven
                                                                                                                                                                                                                                                                                                                                                        Gisela Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                        David Jenish
Tim Krieger
                                                                                                                                                                                                                                                                                                                       Phyllis Krygsman
                                                                                                                                                                                                                                                                                                                                        Eva Walczyk
                                                                                                                                                                                                                                                                                                                                                                      Lawrence T. Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                            Michael
                                                                                                                                                                                                                                                                                                                                                                                                                           Dany Hadary
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bartfeld, Daniel
16-OCT-1997
                                                                                                                                                                                                                                                                                                                                                                                                           Jenish
                                                                                                                                                                                                                                                                                                                                                                                                                                              .
.
                                                                                                                                                                                                                                                                     METHOD FOR
BACTERIAL I
                                                                                                                                                                                                                                                                                                                                                                                                                                           Butler
                                                                                                                                                                                                    N.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ::
=
                                                                                                                                                                                                                                                                       HOST
                                                                                                                                                                                                      Suite
                                                                                                                                                                                                                                                                       EXPRESSION
HOST CELLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -AGDTQALVDAAAPDLSDTAGNASAENGNAV 397
                                                  Version #1.30
                                                                                                                                                                                                      500
                                                                                                                                                                                                                                                                                       OF.
                                                                                                                                                                                                                                                                                       PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     328
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                   US-08-804-227C-9
Sequence 9, Application US/08804227C
Patent No. 5876991
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γΩ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; MOLECULE TYPE: US-08-951-742-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
Matches 173; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEX: 904136

INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 537 amino acid
APPLICANT: DeHoff, Bradley S.
APPLICANT: Kuhstoss, Stuart A.
APPLICANT: Rosteck, Paul R., Jr.
APPLICANT: Sutton, Kimberly L.
TITLE OF INVENTION: POLYKETIDE SYNTHASE GENES
NUMBER OF SEQUENCES: 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME: Bent, Stephen A.
REGISPATION NUMBER: 29,768
REFERENTATION NUMBER: 01
TELECOMMUNICATION INFORMATION:
TELEPHONE: (202)672-5300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                   503 HYFLDGTLPPTSLRCAP 519
                                                                                                                                                                                                                                                                                                                                              455
                                                                                                                                                                                                                                                                                                                                                                                                                          398
                                                                                                                                                                                                                                                                                                                                                                                                                                                               385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60 ARAARAGIDWEDC---AADWNLPKPIQCGYVTVPMDYAKPYGKQIRLAVDRIGNTGTRSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5 RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTP------GAPVVA 49
                                                                                                                                                                                                                                                              TYLLTGRTDARDVTCAP 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FNDYAA-DCARSPACPLGTDSAQWVNRYHALVDPLVQKP-GKTSDPRGL-----SYAD 328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EF-DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQA 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RFGALLVNPGGPGASAVDMVAAMAPAIAD-TDILRHFDLVGFDPRGVGHSTPALRCRTDA 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PQQS-----WNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATG---Q 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGKGLPPVLIVQSERDAATPYEGAVELHQRFRGSRLITERDAGSHGVTGLVNPCINDRVD
                                                                                                                                                                                                                                                                                                                                                                             APAGAGKVVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM 502
                                                                                                                                                                                                                                                                                                                                                                                                                      YTAVECTDAKWPANWRTWDRDNTRLHRDHPFMTWANAWMNLP----CATWPVKQQTPLNVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                           FNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SAWAPTAEIFS----KYV------AGDTQALVDAAAPDLSDTAGNASAENGNAV 397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WKDWQDWVAANDAAYHLGDTRAEVQDQWLKLRAAAAKKPLGGVVGPAELISFFQSAPYYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPI--EESISQMAGFQTA 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EFVKAPKADPVPG-SEADKRAQRKLAREYAEGCFERSG-EMLPHMTTPNTARDLDVIRAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RQGALIYNPGGPGGSGLRFPARVTNKSAVWANTAKAYDFVGFDPRGVGHSAP-ISCVDPQ 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTGTINALYSPORWKYLTSGLLGLQRGSDAGDLLVLADDY -- DGRDADGHYS--NDQDA 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LGEKKLNYLGVSYGTYLGAVYGTLFPDHVRRMVVDSVVNPSRDKIWYQANLDQDVAFEGR 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   537 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (202)672-5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20.8%; Score 570.5; DB 3; 31.1%; Pred. No. 6.9e-45; tive 82; Mismatches 233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0189740/0140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                           444
                                                                                                                                                                                                                                                                                                                                            514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21;
```

```
Š
                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                            Q
                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                             δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; TOPOLOGY: un; MOLECULE TYPE: US-08-804-227C-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 134;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Plant, Thomas, G.
REGISTRATION NUMBER: 35,784
REFERENCE/DOCKET NUMBER: X:
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                              1718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1541
                                                                                                                                                                                                                                                                                                                                                                           1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1426 AAGPEGGAADPAGAAVWGLVRVAQAEQPGRFTLVDVDGTQASLRALPGLLATDAGQSAVR 1485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE CHARACTERISTICS:
LENGTH: 1996 amino aci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CORRESPONDENCE ADDRESS:
ADDRESSEE: THOMAS G. PLA
STREET: LILLY CORPORATE
                                                                                                                                                                                                                                                                                                                                                                                                                                               1601 PDEHPLTCVVHTAGVLDDGVLSAQTAERIDTVLRPKADAAVHLDELTREIGR--VPLVIY 1658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM:
468 GVDLARQLGAPLITFDGTQ--HTAVFDGNQCVDSAVMHYFLDG
                                                                                                                                                                                                                                                                                                                                                                                                               199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OPERATING SYSTEM: MS-DOS
SOFTWARE: ASCI(DOS) Text only
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET: LILLY CORPC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           72 CATVSVP--VDYDQP----GGTQAKLAVIRVP-ATGQRFGALLVNPGGPGASAVDMVAAM 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26 AAPPLAGATEEPGA------GQTPG----APVVAPQQSWNSCREFIADTSEIRTAR 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEPHONE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNTRY:
                                                                                                                                                             GLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQ 411
                                                                                                                                                                                                                                                      PLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                              YLERFG----THVRAMVLDGAI---DPAVSPIEESISQMAGFQTAFNDYAADCARSPAC 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ARHLYDRHKVRHLLLVGRRGPDAPGVDRLVAELTESGAEVAVRACDVTDRDALRRLLDAL 1600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DGRVTVPRLVPVADPVPHGGGTAADGTGAGEPSATLDPEGTVLIT-GGTGA----LAAET 1540
                                                          -----RLAGRSAPERTALLLDLVRTEV---AAVLGHGDPAAIGAARTFKDAGFDSLT 1858
                                                                                              VAPFLSYGQFTG-SAPRDLCALWPVPATSTPHPAAPAGAGKVVVVS---TTHDPATPYQS 467
                                                                                                                                     ------DEDG-----AVR--PAPAPADAAGTLAA-----
                                                                                                                                                                                                                                                                                            RVRRSGLAPLDAGAALDLLDRALTRPEPALLPVRLDLRAAAG-ATALPEVLRDLAGVPA- 1775
                                                                                                                                                                                                                                                                                                                                                                         SSVSATLGSAGQAGYAAANAFMDALAARRCAAGHPALS-LGWGWWSGVGLATGLDGADAA 1717
                                                                                                                                                                                                                                                                                                                                                                                                           SFL-ANIGTASVA-----RDMDMV---RQALGDDQINYLGYSYGTKLG-----TA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APAIADTDILRHFDLVGF---DPRGVGH-----STPALRCRTDAEFDAYRR--DPM 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               46285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1996 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  317-276-2459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4.0%; Score 108.5; D 23.0%; Pred. No. 0.61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US/08/804,227C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PLANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          50; Mismatches 186;
                                                                                                                                                                                                                 ----DARSTPGAAAGTG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         X-8231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
                    508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
```

213;

Gaps

32;

1809

351

В

1859 AVDLRNRLN----TRTGLRLPATLVFD--HPTPLALAELLLDG 1895

```
; SEQUENCE CHARACTERISTICS:
; LENGTH: 1996 amino acids
; TYPE: amino acid
; TOPOLOGY: unknown
; MOLECULE TYPE: peptide
US-08-804-198-3
₹
B
                                                                                                                                             δÃ
                                                                                                                                                                                                  망
                                                                                                                                                                                                                                             õ
                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                             В
                                                Ş
                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-804-198-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
4.0%; Score 108.5; DB 2; Length 1996;
Rest Local Similarity 23.0%; Pred. No. 0.61;
atches 134; Conservative 50; Mismatches 186; Indels 213; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 3, Application US/08804198 Patent No. 5945320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: Macintosh
OPERATING SYSTEM: Macintosh 7.0
SOFTWARE: Microsoft Word 5.1
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/804,198
FILLING DATE:
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEPHONE: 317-276-3885
INFORMATION FOR SEQ ID NO: 3:
  1718 RVRRSGLAPLDAGAALDLLDRALTRPEPALLPVRLDLRAAAG-ATALPEVLRDLAGVPA- 1775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: CANTRELL, PAUL R.
REGISTRATION NUMBER: 36,470
REFERENCE/DOCKET NUMBER: P9113
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1426 AAGPEGGAADPAGAAVWGLVRVAQAEQPGRFTLVDVDGTQASLRALPGLLATDAGQSAVR 1485
                                                                                                                                                                                             1601 PDEHPLTCVVHTAGVLDDGVLSAQTAERIDTVLRPKADAAVHLDELTREIGR~-VPLVLY 1658
                                                                                                                                                                                                                                                                                                                                                                                           1486 DGRVTVPRLVPVADPVPHGGGTAADGTGAGEPSATLDPEGTVLIT-GGTGA----LAAET 1540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: Richardson, Mark A.
APPLICANT: ROSteck, Paul R., Jr.
TITLE OF INVENTION: PLATENOLIDE SYNTHASE GENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQUENCES: 6
CORRESPONDENCE ADDRESS:
ADDRESSEE: PAUL R. CANTRELL 1138
STREET: LILLY CORPORATE CENTER
                                                                                                                                                                                                                                                                                             1541 ARHLVDRHKVRHLLLVGRRGPDAPGVDRLVAELTESGAEVAVRACDVTDRDALRRLLDAL 1600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: Burgett, Stanley G. APPLICANT: Kuhstoss, Stuart A.
                                                                                                                                                                                                                                                                                                                            125 APAIADTDILRHFDLVGF---DPRGVGH------STPALRCRTDAEFDAYRR--DPM 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                     199
                                                                                                                                                                                                                                             240 YLERFG----THVRAMVLDGAI---DPAVSPIEESISQMAGFQTAFNDYAADCARSPAC 291
                                                                                                                                                                                                                                                                                                                                                                                                                  72 CATVSVP--VDYDQP----GGTQAKLAVIRVP-ATGQREGALLVNPGGPGASAVDMVAAM 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STREET: LILLY CORPORTY: INDIANAPOLIS
STATE: IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26 AAPPLAGATEEPGA------GQTPG----APVVAPQQSWNSCREFIADTSEIRTAR 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ZIP: 46285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNTRY:
                                                                                                                                           SFL-ANIGTASVA------ROMDMV---ROALGDDQINYLGYSYGTKLG------TA 239
                                                                                                  SSVSATLGSAGQAGYAAANAFMDALAARRCAAGHPALS-LGWGWWSGVGLATGLDGADAA 1717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1996 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Rao, Nagaraja R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        32;
```

	2253711	Qy 176 AGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQI :	
	175 3662	Qy 119 DMVAAMAPAIADTDILRHEDLVGEDPRGVGHSTPALRCRTDAEEDAYRRDPMADYSP : : :	
	118 3620	Qy 63 DTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAV 1 :::: : ::	
	62 3570	Qy 8 PLSSALLSFGLLL-GGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIA (
27;	ps	Query Match 3.9%; Score 106.5; DB 3; Length 4551; Best Local Similarity 21.1%; Pred. No. 3.4; Matches 125; Conservative 60; Mismatches 223; Indels 185; Gaps	
		; LENGTH: 4551 ; TYPE: PRT ; ORGANISM: Streptomyces venezuelae US-09-320-878-1	
	-	RLIER FILING DATE: 1998-05-28 MBER OF SEQ ID NOS: 34 TOWARE: Patentin Ver. 2.0	
		APPLICATION NUMBER: 6 FILING DATE: 1998-09-APPLICATION NUMBER: 6	
		FILING DATE: 1997-04-30 APPLICATION NUMBER: 60/119,139 FILING DATE: 1999-02-08	
	٠	ATION I DATE: ATION I	
		CURKENT FILING DATE: 1999-05-2/ EARLIER APPLICATION NUMBER: CIP OF 09/141,908 EARLIER FILING DATE: 1998-08-28	
		F INVENTION: FERENCE: 30062 APPLICATION N	
		CANY: BELLACH, MGIY C. CANT: MCDANIEL, RObert CANT: TANG, Li	
		L INFORMATION: CANT: ASHLEY, CANT: BETLACH,	
	:•	RESULT 12 US-09-320-878-1 ISequence 1, Application US/09320878A	
		Db 1859 AVDLRNRLNTRTGLRLPATLVFDHPTPLALAELLLDG 1895	
		DLARQLGAPLITFDGTQHTAVFDGN	
	467 1858	QY 412 VAPELSYGQETG-SAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQS . :	
	1809	Db 1789DEDGAVRPAPAPADAAGTLAA	
	411	'AADQRTRQ	
	351 1788	QY 292 PLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGTT	

Qy

D δÃ

밁

밁 Qy 밁 Qy 망 Qy В

```
US-08-796-414B-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 1, Application US/08796414B Patent No. 5876987 GENERAL INFORMATION:
                                                                                                                                          ATTORREY/AGENT INFORMATION:
NAME: Ian C. McLeod
REGISTRATION NUMBER: 20,931
REFERENCE/DOCKET NUMBER: MSU 4.1-297
TELECOMMUNICATION INFORMATION:
TELEPHONE: (517) 347-4100
TELEFAX: (517) 347-4103
TELEEX: No. 5876987e
                                                                                                                                   INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Wendy C. APPLICANT: and Todd TITLE OF INVENTION: TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM: MEDIUM TYPE: Diskette,
                                                                                                                SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                         OPERATING SYSTEM: MS-DOS 5.00 SOFTWARE: Wordperfect 5.1 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CORRESPONDENCE ADDRESS:
ADDRESSEE: Ian C. McLeod
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3712
                    TOPOLOGY: L:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3766 TVHAAGAAAARVRLASAGTDAVSLSLTDGEGRPLVSVERLTLRP-VTADQAAASRVGGLM 3824
       HYPOTHETICAL:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        226 NYLGYSYGTKLGTAYLERFGTH-----VRAMVLDGAIDPAVSPIEESISQMAGFQTAF
                                                                                                                                                                                                                                                                                             FILING DATE:
                                                          TYPE: Amino Acid
STRANDEDNESS: Sir
                                                                                                                                                                                                                                                                                                                                                                       FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET:
                                                                                             LENGTH:
                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGEDLSHAAAWGLVRTAQTENPGRFGLLDLADDASSYRTLPSVLSDAGLRDEP 4006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NDYAAD--CARSPACPLGTDS----AQWVNRYHALVDPLVQKPGKTSDPRGLS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EHLAGTRLLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SQDVAA------GAPAPRTVLAPLPAGPADGGAEGVRGTVARTLELLQAWL-AD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HRVAWRPYALASSGE----QDPHATSYGPTAVLGKDELKVAAALESAGVEVGLYPDLAAL 3880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SGVDLARQLGAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQ 466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NATAPATANGGGSAAAAPYGIHPALLDASLHAIAVGGLVD-----EPELVRVPFHWSGV 3765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----YADATTGTINALYSPQRWKYLTSGLLGLQR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        48864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Okemos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Michigan
                                                                                                  571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2190 Commons Parkway
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        wendy C. Champness, I
and Todd B. Anderson
                                         Linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Acer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ian C.
                                                                                                                                                                                                                                                                                                                                                                     February 6, 1997
                      Amino Acid
                                                          Single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -VTRGAVRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Champness, Paul Brian
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DISRUPTION OF AN Absa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANTIBIOTIC DUE TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      METHOD, DNA AND BACTERIA FOR HYPERPRODUCTION OF AN
                                                                                                                                                                                                                                                                                                                                                                                          US/08/796,414B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3.5 inch,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----GSDAG---DLLVL 365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----AWVAAD 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЪ
                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                            Db
                                                                                                                                                                                                                                                                                                            δδ
                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                          Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QУ
GENERAL INFORMATION:
APPLICANT: Schupp, Thomas
APPLICANT: Ligon, James
APPLICANT: Molnar, Istvan
APPLICANT: Zirkle, Ross
                                                                                                                                                                                                                                                                                                                                                                                        367
```

```
RESULT 14
US-09-335-409-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-796-414B-1
Sequence 10, Application US/09335409 Patent No. 6121029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 93; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PUBLICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                POSITION IN GENOME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IMMEDIATE SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FRAGMENT TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ANTI-SENSE:
                                                                                                                                                                                                                                                                                                                                                                                            330
                                                                                                                 507
                                                                                                                                                                                                                                                                                                                                                                                                                                   278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      170 AGWEHAEQLEWRQRYIADQARMKERARIAQDIHDSLGHELSVMALLAGGLELAPGLSDPH 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           176 AGVTHVEQV-YRQ------LAQDCVDRMG--FSFLANI-GTASVARDM-DMV 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM: SU
                                                                                                                                                                                                                                                                                                                                                    335 TVVSVVNERPERGGSVPAAGS-----GSGLIGLDERVRLAGGTLRTGPRAGGFEVYAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 272 -AGEQTAENDYAADCARS-PACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADA 329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ISSUE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RELEVANT RESIDUES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VOLUME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JOURNAL:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AUTHORS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IDENTIFICATION METHOD: OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANELLE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CELL LINE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CELL TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TISSUE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEVELOPMENTAL STAGE: HAPLOTYPE: N/A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INDIVIDUAL ISOLATE:
                                                                                                                 ETRADLAPALPERRIKKPPPVTS--EPSVPAG
                                                                                                                                                                                          ASRAALLRTRARIRRDARRAALIPAVLGAAIVAFLG-GLYVFTSATTSLAPEDYARIRVG
                                                                                                                                                                                                                                                                       LPRGASSPSRSTEPPGPADGDGTAGGSGDGTAPGAATAGNEGRAAAAAADLPAPSGPWRS
                                                                                                                                                                                                                                                                                                                                                                                                                                 RSGTPVRFQE----DGARDRPGTPLLSDLAAYRVVQEALTNAAKHAPGAPIDVRVTHTADE 334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESVG--QLR------ERCTMATERL--HEVIGLLREDPNPSLTPADESVAQLVRRFQ 277
                                                                                                                                                                                                                                ---AAWVAADQRIRQ---
                                                                                                                                                                                                                                                                                                                                                                                              TT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQM-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         No
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AbsA1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             unicellular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N/A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N/A
                                                                                                                                                                                                                                                                                                                                                                                          -GTINALYSPQRWKYLTSGLLG-----
                                                                                                                                                 --WPVPATSTPHPAAPAG 448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IN SEQ ID
                                                                                                                                                                                                                                                                                                             ----DDYDGRDADGHYSNDQDAFNAVRCVYA----PTPADP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3.9%; Score 106; DB 2; Length 571; 23.7%; Pred. No. 0.15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     deduced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           organism
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                ---VAPFLSYGQF-----TGSAPRDLCAL--- 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   117;
                                                                                                                                                                                                                                                                                                                                                                                        -LQRGSDAGDLLVLA- 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
```

22;

271

399 387

447

```
: APPLICANT: Cyr, Devon
: APPLICANT: Goevlach, Joern
: TITLE OF INVENTION: GENES FOR THE BIOSYNTHESIS OF EPOTHILONES
: FILE REFERENCE: 4-30582A
: CURRENT APPLICATION NUMBER: US/09/335,409
: CURRENT FILING DATE: 1999-06-17
: NUMBER OF SEQ ID NOS: 30
: SOFTWARE: Patentin Ver. 2.0
: SOFTWARE: Patentin Ver. 2.0
: SEQ ID NO 10
: LENGTH: 423
: TYDE: PRT
: ORGANISM: Sorangium cellulosum
US-09-335-409-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-804-227C-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                               Patent No. 5876991
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                             Sequence 10,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 104; Conservative 42; Mismatches 132;
                                                                                                                                                                                           APPLICANT: DeHoff, Bradley S.
APPLICANT: Kubstoss, Stuart A.
APPLICANT: Rostcck, Paul R., Jr.
APPLICANT: Sutton, Kimberly L.
TITLE OF INVENTION: POLYKETIDE SYNTHASE GENES
NUMBER OF SEQUENCES: 15
CORRESPONDENCE ADDRESS:
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              137
                                                                                                               STREET: LILL CONTY: INDIANAPOLIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420 QFTGSAPRDLCAL---WPVPATSTPHPAAPAGAGKVVVVSTTHD 460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300 WVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQRGSDA 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    261 YFTDEQTGEKTRMDRDGAESAYASP-PAFPSGAAG--LVSTVDD 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         44
                                                                   ZIP: 46285
                                                                                         COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               77 VPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAAMAPAIADTDILRH 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20 LGGLLLAAPP---LAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVS 76
                                                                                                                                                                              ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QGVLV-----GRAADQGF-----DAFVRERILAPLGMRDTDFHVPAD-----KLARFAGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYG 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WIRRLGTL -- PLMHQPG -----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDETVPAERPITVRDLMTFTMGFGISF-DASSPIQRAIDELGLVNAQPVPMTPHGPD--E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AVMMLVEEGKLDLDSPVDRWLPELANRKV-------LAR------IDGP 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRM 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ID---PAVSPI--EESISQMAGFQTAFNDYAADCARS-----PACPLGTDSAQ 299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGA 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VDAVGVTE--LGGSAP------KAVTAT 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MGALISVAAPGCALGGAEEEGQPGQDAGAGALAP----AREVMA--AEV-----
                                                                                                                                                                                                                                                                                                                                                                         0, Application US/08804227C 5876991
                                                                                                                                                   E: THOMAS G. PLANT 15
                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3.8%; Score 104; DB 3; Length 423; 22.4%; Pred. No. 0.15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---AAGQMPGAVWLVARG--
                                                                                                                                                                              1501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----AQWMYNT-----GSLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ----- -DDV---H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              26;
```

```
Вþ
                                                                                                                         Š
                                                                                                                                                                   B
                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                       Db
                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; MOLECULE TYPE: peptide US-08-804-227C-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
Matches 101; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
NAME: Plant, Thomas, G.
REGISTRATION NUMBER: 35,784
REFERENCE/DOCKET NUMBER: X-8:
TELECOMMUNICATION INFORMATION:
TELEPHONE: 317-276-2459
                                                                                   2458
                                                                                                                                                                                                                                                         2378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CURRENT APPLICATION DATA:
                                                                                                                                                                     2402 LCRAYTHGLEIDAEAIFGPDSRQVELPTYPFQRERYWYSPG----HRGDDPASLGLDAVD
                                                                                                                                                                                                                                                                                                                                         2318 VTGGLIDTAELDADYWYRNMREPVEFEQATRALIADGHDVFLESSPHPMLAVSLQETISD 2377
                                                                                                                                                                                                                                                                                                                                                                                                                          2258 DPDALAELVAELGAEGVHARPIPGVDTAGHSPQVDTLEAHLRKVLAPVAPRTSDIPFYST 2317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2198 LDDAARIVALRSQAWLRLAGKGGMVAVTLSERDLRPRLEPWSDRLAVAAVNGPETCAVSG 2257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2143 PGAPSLDRVDVVQPVLFTMMVSLAET----WRSLGVEPAAVVGHSQGEIAAAYVAGALT 2157
                                     427 RDLCALWPVPATSTPHPAAPAGAGKVVVVVSTTHDPATPYQSGVDLARQLGAP 478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      156 CRTDAEFDAYRRDPMADYSPAG----VTHVEQVYRQLAQDCVDRMGFSFLANIGTASVAR 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        110 PGGPGASAVDMVA----AMAPAIADTDILRHFDLVGFDPRG-VGHS-----TPALR 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       212
                                                                                                                           369 YD--GRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAP 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: amino acid TOPOLOGY: unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: US/08, FILING DATE: February 21,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENGTH:
                                                                                   HPLLGSGVELPESGD------RMYTARLGADTTPWLADHALLG--SPLL-----PGAAF
                                                                                                                                                                                                           YADATTGTI----NALYSP------QRWKYLTS-GLLGLQRGSDAGDLLVLADD 368
                                                                                                                                                                                                                                                       -----AGSPAAVLGTLRRGQGGPRWL-----GVA 2401
                                                                                                                                                                                                                                                                                               MAGFQTAFNDYAADCARSPACPLGT-----DSAQWVNRYHALVDPLVQKPGKTSDPRGLS 325
                                                                                                                                                                                                                                                                                                                                                                                KLG----TAYLE------RFGTHVRAMVLDG---AIDPAVSP-----IEESISQ 270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DMDMVRQALGD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3724 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ASCI(DOS) Text only
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3.7%;
21.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MS-DOS
AGROAGTGRVEELTLAAPLVLPGSGGVRLRLNVGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US/08/804,227C
ry 21, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----DQINYLGYS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 101; DB 2;
Pred. No. 8.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   X-8231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  149; Indels 172;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 3724;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----YTF 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                     2457
```

24;

Search completed: January 5, 2001, 14:27:24 Job time: 216 sec

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Minimum DB seq
Maximum DB seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          on:
A_Geneseq_36:*

1: /SIDS1/gcgdata/geneseq/geneseqp/AA1980.DAT:*
2: /SIDS1/gcgdata/geneseq/geneseqp/AA1981.DAT:*
3: /SIDS1/gcgdata/geneseq/geneseqp/AA1983.DAT:*
4: /SIDS1/gcgdata/geneseq/geneseqp/AA1983.DAT:*
5: /SIDS1/gcgdata/geneseq/geneseqp/AA1984.DAT:*
6: /SIDS1/gcgdata/geneseq/geneseqp/AA1984.DAT:*
7: /SIDS1/gcgdata/geneseq/geneseqp/AA1985.DAT:*
8: /SIDS1/gcgdata/geneseq/geneseqp/AA1989.DAT:*
9: /SIDS1/gcgdata/geneseq/geneseqp/AA1989.DAT:*
10: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
11: /SIDS1/gcgdata/geneseq/geneseqp/AA1990.DAT:*
12: /SIDS1/gcgdata/geneseq/geneseqp/AA1991.DAT:*
13: /SIDS1/gcgdata/geneseq/geneseqp/AA1992.DAT:*
14: /SIDS1/gcgdata/geneseq/geneseqp/AA1993.DAT:*
15: /SIDS1/gcgdata/geneseq/geneseqp/AA1994.DAT:*
16: /SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT:*
17: /SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT:*
18: /SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT:*
19: /SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT:*
19: /SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT:*
20: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
21: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
22: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
23: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
24: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
25: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
26: /SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-461-774-4
2738
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  268485 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 AAMWRRRPLSSALLSFGLLL.....AVMHYFLDGTLPPTSLRCAP 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      January 5, 2001, 14:26:28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  34193795 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Search time 62.98 Seconds (without alignments) 281.781 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     268485
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

12 1	11 113	10 1	9 1	8 128	7 1	6 570	5 570	4 647	3 653	2 7	1 7	Result No. Score
•	•	•	_	28 4.7	_	-	-	-	-	_	_	1
732	459	1291	1051	3119	785	537	537	513	513	539	539	Query Match Length DB
19 W7206	12 R134	19 W599	19 W523	19 W72204	19 W721	20 W877	16 R805	16 R805	20 W877	20 W87799	16 R8050	DB ID
	98 P.denitrificans CO			04 HSV-2 strain SB5 C				_			3. lividans protea	Description

22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	13 14 15 16 17 17 18 19 20 20 21 22 23
102.5 102.5 102.5 102.5 102.1 102.1 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 101.5 102.5 103.5	108.5 108.5 108 108 108 108 108.5 106.5 106.5
	446666666666666666666666666666666666666
423 574 613 534 920 920 590 590 582 928 928 928 928 928 928 928 928 928 9	1996 1996 1638 1638 1638 12199 4551 4613 4613 4613 4613
10 10 10 10 10 10 10 10 10 10 10 10 10 1	18 20 20 20 21 21 21 21 21 21 21 21 21 21
Y58581 W23300 Y05278 Y75291 Y77891 Y78841 W31771 W71188 R42306 R42378 W23718 W23718 W23718 W23718 W23718 W23718 W23718 W23718 W23718 W23718 W23718 W3718 W3718	W22607 W23717 Y00138 Y00142 Y77180 Y67201 Y77192 Y77192 Y77290 W78491 Y77276 Y78828
Scopulariopsis bre Scopulariopsis bre Scopulariopsis bre S. brevicaulis bet T. mays ckx1 prote Streptomyces cinna KSq-ATq loading di H chain subunit of Anti-human Fas mon Phospholipase D-P. Streptomyces antib KSq-ATq loading di Platenolide syntha Platenolide syntha Platenolide syntha Amino acid sequenc Actinoplanes Sp. a Xanthomonas campes Pseudomonas offx s Pseudomonas alcali Protein isolated f Streptomyces venez Rubella virus RA27	Platenolide yntha platenolide syntha Enterococcus faeca Enterococcus faeca Enterococcus faeca S. venezuelae pik Narbonolide syntha S. venezuelae macr S. venezuelae pik S. coelicolor AbsAl Streptomyces cinna Amino acid sequenc

ALIGNMENTS

```
RESULT
R80506
Protease: metalloendoproteinase: tripeptidyl aminopeptidase;
protease-deficiency; protein secretion.
                                                                                                                                                                                                                                         R80506;
                                                                                                                                                                                                                                                         R80506 standard; Protein; 539 AA
      WPI; 1995-240673/31
N-PSDB; Q99366.
                              Bartfeld D, Butler MJ, Malek LT, Soostmeyer G,
                                                                     23-DEC-1993;
                                                                                                     29-JUN-1995
                                                                                                                                           Peptide
                                                                                                                                                    Key
                                                                                                                                                                  Streptomyces lividans.
                                                                                                                                                                                                        S. lividans protease P5-6.
                                                                                                                                                                                                                        04-DEC-1995
                                                                                     22-DEC-1994;
                                                                                                                    W09517512-A
                                                     (CANG-) CANGENE CORP.
                                                                                                                                                                                                                        (first entry)
                                                                     93US-0173508
                                                                                     94WO-US14772
                                                                                                                                              Location/Qualifiers
1..47
                                                                                                                                   /label= Sig_peptide
                              Hadary D,
Walcyzk E;
                                     Jenish DL,
                                     Krieger TJ;
```

```
RESULT
W87799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
Matches 203; Conserv
Tripeptidyl aminopeptidase; TAP; N-terminal cleavage; protein production; GM-CSF; interleukin-3; IL-3; IL-6; EPO; tumour necrosis factor; TNF;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Protease Tap-negative cells were transformed with a S. lividans 66 genomic library and screened with APA-beta-naphthylamide to isolate colonies conts. genes (99365-68) for novel proteases P5-4, P5-6, P5-10 and P8-2 (R80505-08). Impaired expression of such proteases by Streptomyces hosts improves the quality, quantity and stability of exogenous gene products.
                                                                                   19-MAR-1999
                                                                                                                                                    W87799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 4; Fig.14; 142pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Endogenous Streptomyces protease(s), opt. having impaired activity useful in prodn. of exogenous proteins with reduced proteolytic
                                                Aminopeptidase SlpD encoded by clone P5-6.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                     534
                                                                                                                                                                                                                                                                                                        474
                                                                                                                                                                                                                                                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           242
                                                                                                                                                                                                                                                                                                                                         454
                                                                                                                                                                                                                                                                                                                                                                          417
                                                                                                                                                                                                                                                                                                                                                                                                           400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4 WRRRPLSSALLSFGLLLGGLLLA----APPLAGATEEPGAGQTPGAPVVAPQQ-----
                                                                                                                                                                                     N
                                                                                                                                                                                                                                                                       TSLRCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        dgkrcs
                                                                                                                                                                                                                                                                                                      vvgttrdpatpyrwaealsdqltsghlltyegdghtaygrgsscidsaintylltgtape 533
                                                                                                                                                                                                                                                                                                                                       VVSTTHDPATPYQSGVDLARQL-GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CARSPACPLG---TDSAQWVNRYHALVDPLVQK--PGKTSDPRGLSYADATTGTINALYS 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --tdvtpddagetdelvdaykefaegcgadap--kllrhvstveaardmdvlravlgdek
                                                                                                                                                                                                                                                                                                                                                                      aafsspde-vrdalpdfekaspvfge--glawsslncaywpvkptgephrieaagatpiv
                                                                                                                                                                                                                                                                                                                                                                                                                                          egawqqlresltsaikekdgagllilsdsyyereadggysnlmfanaavncldl----p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PORWKYLTSGLLGLORGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \verb|cvkqpdcplgdkdttpdqvgknlks| fddldakplpagdadgrkltes| lattgvia amyd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PMADYSP--AGVT-HVEQVYRQLAQDC-VDRMGFSFLANIGTASVARDMDMVRQALGDDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          npggpggsaigylqqyagigypakvraqydmvavdprgvarsep-vecldgremdaytr-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            klgwrdc----gvpgfqcatmkapldyakpadgdvrlavarkkatgpgkrlgsllv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --SWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT--GQRFGALLV
                                                                                                                                                                                                                                                                                                                                                                                                         AAWVAADQRIRQVAPFLS----YGQFTGSAPRDL-CALWPVPATSTPHPAAPAGAGKVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fratlltaallatacsaggastsagspaakaagateaatatltp-lpkatpaelspyyeq 75
                                                                                                                                                    standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 539
                                                                                                                                                                                                                                     539
                                                                                                                                                                                                                                                                       518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                  Protein;
                                                                                 entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 28.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 780; DB 16; Pred. No. 1.7e-60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 220;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 539;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              127
                                                                                                                                                                                                                                                                                                                                         512
                                                                                                                                                                                                                                                                                                                                                                            473
                                                                                                                                                                                                                                                                                                                                                                                                                                          416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19;
Š
                                 DЪ
                                                              QУ
                                                                                                 밁
                                                                                                                                Qγ
                                                                                                                                                                 В
                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The present sequence represents an aminopeptidase designated SlpD. specification also describes a tripeptidyl aminopeptidase (TAP) of Streptomyces. The aminopeptidase is endogenous to Streptomyces and cleaves an N-terminal sequence of X-Pro-Y, where X is an aliphatic or hydroxy amino acid and Y is an aliphatic, hydroxy or sulphur-containing amino acid. The TAP of Streptomyces are useful the production of proteins, such as GM-CSF, interleukin-3 (IL-3). IL-6, EPO, tumour necrosis factor (TNF) SCF, IL-7 and IL-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomyces tri:peptidyl aminopeptidase - N-terminal pro-peptide from secreted prote:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim 4; Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bartfeld
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               24-JUN-1994;
23-DEC-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  05-JAN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SCF;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (CANG-) CANGENE CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US5856166-A.
                                  302
                                                                                                                                                                                                                                     128
 340
                                                                285
                                                                                                                                                                   186
                                                                                                                                                                                                    169
                                                                                                                                                                                                                                                                       109
                                                                                                                                                                                                                                                                                                        76
                                                                                                                                                                                                                                                                                                                                         53
                                                                                                                                                                                                                                                                                                                                                                          17
                                                                                                                                                                                                                                                                                                                                                                                                         4 WRRRPLSSALLSFGLLLGGLLLA----APPLAGATEEPGAGQTPGAPVVAPOQ-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1999-105117/09
PQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADP\\
                                                                                                 ltyvgasygtflgatyaglfpdrtgrlvldgamdpslparrlnleqtegfetafqsfakd
                                                                                                                                  INYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAAD
                                                                                                                                                                 --tdvtpddagetdelvdaykefaegcgadap--kllrhvstveaardmdvlravlgdek
                                                                                                                                                                                                                                                                                                    klgwrdc-----gvpgfqcatmkapldyakpadgdvrlavarkkatgpgkrlgsllv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IL-7;
                               cvkqpdcplgdkdttpdqvgknlksffddldakplpagdadgrklteslattgviaamyd
                                                              CARSPACPLG---TDSAQWVNRYHALVDPLVQK--PGKTSDPRGLSYADATTGTINALYS
                                                                                                                                                                                                   PMADYSP--AGVT-HVEQVYRQLAQDC-VDRMGFSFLANIGTASVARDMDMVRQALGDDQ
                                                                                                                                                                                                                                  npggpggsaigylqqyagigypakvraqydmvavdprgvarsep\hbox{-}vecldgremdaytr\hbox{-}
                                                                                                                                                                                                                                                                       NPGGPGASAVDMVAAMAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRD
                                                                                                                                                                                                                                                                                                                                       --SWNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPAT--GQREGALLV
                                                                                                                                                                                                                                                                                                                                                                      fratlltaallatacsaggastsagspaakaagateaatatltp-lpkatpaelspyyeq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IL-2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Butler MJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            25A-C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94US-0265310
93US-0173508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94US-0265310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note=
48..539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P5-6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            83pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        28.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "mature protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SlpD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Garven
Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          English.
                                                                                                                                                                                                                                                                                                                                                                                                                                            69;
                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 780; DB 20;
Pred. No. 1.7e-60;
9; Mismatches 220;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                peptide"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Hadary D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Soostmeyer G,
                                                                                                                                                                                                                                                         =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jenish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Walczyk E;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             removing
                                                                                                                                                                                                                                                                                                                                                                                                                                            54;
                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
```

Ħ.

g δÃ Ъ

В δÃ

24] 224 185 168 127 108 75 52

19;

361

301

K K X B X B X A X B

20

멍

Š

뫄

Ş

밁

οy

В Ş В Š

밁

```
SXCCCCCCCX PX PT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
W87798
ID W
   밁
                      Qy
                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                      The present sequence represents an aminopeptidase designated SlpE. The specification also describes a tripeptidyl aminopeptidase (TAP) of Streptomyces. The aminopeptidase is endogenous to Streptomyces and cleaves an N-terminal sequence of X-Pro-Y, where X is an aliphatic or hydroxy amino acid and Y is an aliphatic, hydroxy or sulphur-containing amino acid. The TAP of Streptomyces are useful in the production of proteins, such as GM-CSF, interleukin-3 (IL-3), IL-6, EPO, tumour necrosis factor (TNF) SCF, IL-7 and IL-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Tripeptidyl aminopeptidase; GM-CSF; interleukin-3; IL-3; SCF; IL-7; IL-2; P8-2; SlpE.
                                                                                                       Sequence
                                                                                                                                                                                                                                 Claim 6; Fig 29A-C; 83pp; English.
                                                                                                                                                                                                                                                       Streptomyces tri:peptidyl aminopeptidase - useful for removing N\text{-}\text{terminal} pro-peptide from secreted proteins
                                                                                                                                                                                                                                                                                                                            Bartfeld D,
Krieger TJ,
                                                                                                                                                                                                                                                                                                                                                                                      24-JUN-1994;
23-DEC-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                        24-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             W87798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W87798 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                              05-JAN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US5856166-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Aminopeptidase SlpE encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19-MAR-1999
                                                                                                                                                                                                                                                                                                                                                               (CANG-) CANGENE CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  362
   10
                         18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω
                                                                                                                                                                                                                                                                                                     1999-105117/09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          III:
dgkrcs 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TSLRCA 518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VVSTTHDPATPYQSGVDLARQL-GAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aafsspde-vrdalpdfekaspvfge--glawsslncaywpvkptgephrieaagatpiv
ltaaaalltagcsggssdedkddggrssagpsaaapsgvpealasqtldwarc----
                        LLLGGLLLAAPPLAGATEE------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       vvgttrdpatpyrwaealsdqltsghlltyegdghtaygrgsscidsaintylltgtape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAWVAADQRIRQVAPFLS----YGQFTGSAPRDL-CALWPVPATSTPHPAAPAGAGKVV
                                                                                                       513
                                                                                                                                                                                                                                                                                                                         Krygsman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first
                                                                                                                                                                                                                                                                                                                                        Butler MJ,
                                                                                                       AA;
                                                                                                                                                                                                                                                                                                                                                                                      94US-0265310
93US-0173508
                                                                                                                                                                                                                                                                                                                                                                                                                        94US-0265310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entry)
                                                         23.9%;
                                                                                                                                                                                                                                                                                                                            ٦,
                                                                                                                                                                                                                                                                                                                            Garven
Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  513
                                               69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TAP; N-terminal cleavage; protein production;
; IL-6; EPO; tumour necrosis factor; TNF;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            by clone P8-2.
                                             Score 653.5; DB 20;
Pred. No. 2.2e-49;
9; Mismatches 224;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A
                                                                                                                                                                                                                                                                                                                            S,
                      PGAGQTPGAPVVAPQQS--WNSCREFIADT
                                                                                                                                                                                                                                                                                                                           Hadary D, J
Soostmeyer
                                                                                                                                                                                                                                                                                                                         Jenish
er G, Wa
                                               Indels
                                                                   Length
                                                                                                                                                                                                                                                                                                                           Walczyk
                                                                                                                                                                                                                                                                                                                                    DL;
                                             61;
                                                                                                                                                                                                                                                                                                                            H
 -eg
                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ď
                      64
  62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          453
                                                                                                                                                                                                            The
                                               18;
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                            R80508
                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
Protease Tap-negative cells were transformed with a S. lividans genomic library and screened with APA-beta-naphthylamide to
                                    Claim
                                                                   Endogenous Streptomyces protease(s), opt. having impaired activity useful in prodn. of exogenous proteins with reduced proteolytic
                                                                                                                                           Bartfeld D,
Malek LT,
                                                                                                                                                                                                                                                                                                                    Protease; metalloendoproteinase; tripeptidyl aminopeptidase; protease-deficiency; protein secretion.
                                                                                                                                                                                                                                                                                                                                                          S. lividans protease P8-2.
                                                                                                                                                                                                                                                                                                                                                                                   04-DEC-1995
                                                                                                           N-PSDB; Q99368.
                                                                                                                                                                                                     23-DEC-1993;
                                                                                                                                                                                                                           22-DEC-1994;
                                                                                                                                                                                                                                                    29-JUN-1995
                                                                                                                                                                                                                                                                          W09517512-A
                                                                                                                                                                                                                                                                                                Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                         R80508;
                                                                                                                                                                                                                                                                                                                                                                                                                                R80508 standard;
                                                                                                                                                                               (CANG-) CANGENE CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            233 GTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         352 GLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCV---YAPTPADPAAWVAADQR 408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  65
                                                                                                                                                                                                                                                                                                                                                                                                                                                        4
                                                                                                                  1995-240673/31.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gtelggvyahlfpehvgrvildavvdpgadtmghaenqargfqralddylestgqep---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         stm----psyadtvsslherydlvswdprgva-asegvrcrtdeaieaaesvdstpdspa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rrmadelgkdvgvvltwqgeghgaygngsdcvdsavdayllkgtvpkdgkvcs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fekvspv--fgaflgwdtagwchdwpvagqhetaevsapdaapvlvvgntgdpatpyega
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aaeeg-dgsellaladgynerdpsgrygttthsqrvisclddkgrptveetkkll---pr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LGTDSAQWVNRYHALVDPLVQKPGKTSDP-RGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVTHVEQVYRQLAQD----CVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEIRTA-----RCATVSVPVDYDQPGGTQAKLAVIRVPATG-QREGALLVNPGGPGASAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----eeqaylkdaadfgrgcekaag-klmehvsttdtardmdlmrhvlgdermhyfgisy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DMVAAMAPAIADT--DILRHEDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPA 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----eqgsrkiagllerldaeplptsspgreltqtlaftgivlplysesgwpaltsalk
                                    4; Fig.19;
                                                                                                                                           Soostmeyer
                                                                                                                                           Butler MJ,
oostmeyer G,
                                                                                                                                                                                                                                                                                                 lividans
                                                                                                                                                                                                                                                                                                                                                                                 (first
                                                                                                                                                                                                   93US-0173508
                                                                                                                                                                                                                           94WO-US14772
                                    142pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                Protein;
                                                                                                                                                                                                                                                                                                                                                                                entry)
                                    English
                                                                                                                                           Hadary D,
Walcyzk
                                                                                                                                                                                                                                                                                                                                                                                                                                513
                                                                                                                                                                                                                                                                                                                                                                                                                                AΑ
                                                                                                                                            Ħ
                                                                                                                                                       Jenish
                                                                                                                                                      DL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234
```

```
Matches 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             isolate colonies contg. genes (099365-68) for novel proteases P5-4, P5-6, P5-10 and P8-2 (R80505-08). Impaired expression of such proteases by Streptomyces hosts improves the quality, quantity and stability of exogenous gene products.
   Protein
                                                                                                       Streptomyces lividans
                                                                                                                         protease-deficiency; protein
                                                                                                                                      Protease;
                                                                                                                                                         S. lividans protease Tap
                                                                                                                                                                               04-DEC-1995
                      Peptide
                                          Peptide
                                                                         Modified-site
                                                                                                                                                                                                                      R80504 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                          461
                                                                                                                                                                                                                                                                                               469
                                                                                                                                                                                                                                                                                                                  403
                                                                                                                                                                                                                                                                                                                                       409
                                                                                                                                                                                                                                                                                                                                                            347
                                                                                                                                                                                                                                                                                                                                                                               352
                                                                                                                                                                                                                                                                                                                                                                                                     292
                                                                                                                                                                                                                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                                                                                                                                                                                                             235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18 LLLGGLLLAAPPLAGATEE------PGAGQTPGAPVVAPQQS--WNSCREFIADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                         rrmadelgkdvgvvltwqgeghgaygngsdcvdsavdayllkgtvpkdgkvcs
                                                                                                                                                                                                                                                                                             VDLARQLG---APLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPTSLRCA 518
                                                                                                                                                                                                                                                                                                                                    IRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATPYQSG
                                                                                                                                                                                                                                                                                                                                                         aaeeg-dgsellaladgynerdpsgrygttthsqrvisslddkqrptveetkkll---pr
                                                                                                                                                                                                                                                                                                                                                                     GTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GVTHVEQVYRQLAQD----CVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             stm----psyadtvsslherydlvswdprgva-asegvrcrtdeaieaaesvdstpdspa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DMVAAMAPAIADT--DILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEIRTA-----RCATVSVPVDYDQPGGTQAKLAVIRVPATG-QRFGALLVNPGGPGASAV 118
                                                                                                                                                                                                                                                                                                                fekvspv--fgaflgwdtagwchdwpvagqhetaevsapdaapvlvvgntgdpatpyega
                                                                                                                                                                                                                                                                                                                                                                                                  ----eqgsrkiagllerldaeplptsspgreltqtlaftgivlplysesgwpaltsalk
                                                                                                                                                                                                                                                                                                                                                                                                                                          gtelggvyahlfpehvgrvildavvdpgadtmghaengargfgralddylestgqep---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----eeqaylkdaadfgrgcekaag-klmehvsttdtardmdlmrhvlgdermhyfgisy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ltaaaalltagcsggssdedkddggrssagpsaaapsgvpealasgtldwarc----eg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sddapapdgdwrcatlkapldwsdpdgetidlalirsrasgddrigsllfnfggpgasgv
                                                                                                                          metalloendoproteinase; tripeptidyl aminopeptidase;
deficiency; protein secretion.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                            (first entry)
 /label- Autocatalytic_tripeptide
40..537
                      /label= Sig_peptide
37..39
                                                                                  Location/Qualifiers
                                                     /note=
                                                                /label- OTHER
                                                                                                                                                                                                                       Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  23.6%;
33.6%;
                                                     "fMet"
                                                                                                                                                                                                                       537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 647.5; DB 1 Pred. No. 7.3e-49;
                                                                                                                                                                                                                       Ŗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches 222;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             513;
                                                                                                                                                                                                                                                                          513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             179
                                                                                                                                                                                                                                                                                                                                                                              408
                                                                                                                                                                                                                                                                                                                   460
                                                                                                                                                                                                                                                                                                                                                         402
                                                                                                                                                                                                                                                                                                                                                                                                    346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    64
                                                                                                                                                                                                                                                                                                                                                                                                                      351
                                                                                                                                                                                                                                                                                                                                                                                                                                            291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18;
                                                           Ş
                                                                                  밁
  멍
                   20
                                                                                                    Ş
                                                                                                                         밁
                                                                                                                                             Q
                                                                                                                                                                  В
                                                                                                                                                                                    Š
                                                                                                                                                                                                           망
                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                    Вр
                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                             Вр
                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                 SOXCCCCCXXXIII
                                                                                                                                                                                                                                                                                                                                     Вp
                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bartfeld D,
Malek LT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23-DEC-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22-DEC-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         W09517512-A.
 455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    29-JUN-1995
                                          398
                                                              385
                                                                                 354
                                                                                                                                               278
                                                                                                                                                                                                           176
                                                                                                      329
                                                                                                                          294
                                                                                                                                                                  234
                                                                                                                                                                                      220
                                                                                                                                                                                                                                 161
                                                                                                                                                                                                                                                    117
                                                                                                                                                                                                                                                                         102
                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                 50
                                                                                                                                                                                                                                                                                                                                     N
                                                                                                                                                                                                                                                                                                                                                         σ
```

Qy 뮹 Qy B δÔ В Ωy Вb QY 밁 Qy В В Ş 뮍 Qy

밁

```
Query Match
Best Local Similarity
Matches 173; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A genomic library of S. lividans 66 was prepd. in pSS12, and recombinants were used to transform S. lividans 66 protoplasts. Colonies selected for color formation on GPL-beta-naphthylamide contained a gene encoding a novel tripeptidyl aminopeptidase, Tap. Impaired expression of Tap by Streptomyces hosts improves the quality, quantity and stability of exogenous gene products.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim 4; Fig.5; 142pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Endogenous Streptomyces protease(s), opt. having impaired activity useful in prodn. of exogenous proteins with reduced proteolytic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1995-240673/31.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (CANG-) CANGENE CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APAGAGKVVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM
                                                                                                                                                                                                     ytavectdakwpanwrtwdrdntrlhrdhpfmtwanawmnlp---catwpvkqqtplnvk 454
                                                                                                                                                                                                                                                                                                                  FNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPA 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               wkdwqdwvaandaayhlgdtraevqdqwlklraaaakkplggvvgpaelis f. f. qsapyyddin ac a company for the company of the comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FNDYAA-DCARSPACPLGTDSAQWVNRYHALVDPLVQKP-GKTSDPRGL-----SYAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RFGALLVNPGGPGASAVDMVAAMAPAIAD-TDILRHFDLVGFDPRGVGHSTPALRCRTDA 160
tgkglppvlivqserdaatpyegavelhqrfrgsrliterdagshgvtglvnpcindrvd
                                                                                                                                                                                                                                                                                                                                                                                                                          sawaptaeifs----kyv-----agdtqalvdaaapdlsdtagnasaengnav
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTGTINALYSPORWKYLTSGLLGLQRGSDAGDLLVLADDY - - DGRDADGHYS - - NDQDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPI--EESISQMAGFQTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EF-DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     araaragidwedc---aadwnlpkpiqcgyvtvpmdyakpygkqirlavdrigntgtrse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PQQS-----WNSCREFIADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATG---Q 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                rkssirrratafg--tagalvtatliagavsapaasaapadghghgrswdreargaaiaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTP------GAPVVA 49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                lgekklnylgvsygtylgavygtlfpdhvrrmvvdsvvnpsrdkiwyganldqdvafegr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q99364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       537 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Soostmeyer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Butler MJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                93US-0173508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              94WO-US14772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label= Mat_protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Hadary D,
Walcyzk E;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 570.5; DB 1
Pred. No. 4.7e-42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Jenish
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Krieger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     353
514
                                                                                                                                                                                                                                                                                                                                                                                                                                397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     59
```

21;

```
Qy
          Ş
                                  В
                                                                                                                                 XX C C C C C C X X X
                                                                                                                                                                                                                                                                             FTFT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                          Query Match
Best Local S
Matches 173
                                                                                                                                                    The present sequence represents a tripeptidyl aminopeptidase (TAP) Streptomyces. The aminopeptidase is endogenous to Streptomyces and cleaves an N-terminal sequence of X-Pro-Y, where X is an aliphatic or hydroxy amino acid and Y is an aliphatic, hydroxy or sulphur-containing amino acid. The TAP of Streptomyces are useful if the production of proteins, such as GM-CSF, interleukin-3 (IL-3), IL-6, EPO, tumour necrosis factor (TNF) SCF, IL-7 and IL-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Tripeptidyl aminopeptidase; TAP; N-terminal cleavage; protein production; GM-CSF; interleukin-3; IL-3; IL-6; EPO; tumour necrosis factor; TNF; SCF; IL-7; IL-2.
                                                                                                                                                                                                                                            Claim
                                                                                                                                                                                                                                                               Streptomyces tri:peptidyl aminopeptidase - us N-terminal pro-peptide from secreted proteins
                                                                                                                                                                                                                                                                                                                               Bartfeld D,
Krieger TJ,
                                                                                                                                                                                                                                                                                                                                                                                     24-JUN-1994;
23-DEC-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                     24-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                           05-JAN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                US5856166-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tripeptidyl aminopeptidase (tap)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W87796
                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                (CANG-) CANGENE CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               19-MAR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W87796 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   503
                                                                            Local Similarity
nes 173; Conserv
            50
                                  N
                                                     ū
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HYFLDGTLPPTSLRCAP
                                                                                                                                                                                                                                                                                                          1999-105117/09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tylltgrtdardvtcap 531
RRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTP------GAPVVA 49
                               rkssirrratafg--tagalvtatliagavsapaasaapadghghgrswdreargaaiaa
                                                                                                                                                                                                                                         2; Fig 12A-B; 83pp; English
                                                                                                                                 537
                                                                                                                                                                                                                                                                                                                               Butler MJ,
Krygsman P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          lividans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first
                                                                                                                                                                                                                                                                                                                                                                                    94US-0265310
93US-0173508
                                                                                                                                                                                                                                                                                                                                                                                                                     94US-0265310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note=
40..537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Met encoded by TTG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entry)
                                                                                      20.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        _"signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "mature protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   519
                                                                                                                                                                                                                                                                                                                                Garven
Malek
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          537
                                                                          82;
                                                                          Score 570.5; DB 20
Pred. No. 4.7e-42;
2; Mismatches 233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        peptide"
                                                                                                                                                                                                                                                                                                                                S,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein
                                                                                                                                                                                                                                                                                                                                          Hadary D,
                                                                                                                                                                                                                                                                                                                               Soostmeyer G,
                                                                                                DB 20;
                                                                                                                                                                                                                                                                        useful
                                                                                                                                                                                                                                                                                                                                          Jenish DL;
                                                                                                                                                                                                                                                                         for
                                                                            Indels
                                                                                               Length
                                                                                                                                                                                                                                                                                                                                Walczyk E;
                                                                                                                                                                                                                                                                          removing
                                                                            69;
                                                                          Gaps
                                  59
                                                                                                                                                                                                                     of.
                                                                            21;
```

```
W72103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                рb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멼
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                            Chan JY,
Esser KM,
Herpes simplex virus type-2 sequences - useful in, e.g. prevention and treatment of infection or inducing immunological response in
                                                                                                                                        09-JUN-1997;
04-NOV-1996;
                                                                                                                                                                                                                                                                               Key
                                                                                                                                                                                                                                                                                                                                                                                                                        W72103
                                                                                                                                                                                                                                                                                                                                                                                                                                               W72103
                                        N-PSDB;
                                                                                                                                                                              31-OCT-1997;
                                                                                                                                                                                                       14-MAY-1998
                                                                                                                                                                                                                                WO9820016-A1
                                                                                                                                                                                                                                                                     Misc-difference
                                                                                                                                                                                                                                                                                                                                             HSV-2 strain SB5; immunological
                                                                                                                                                                                                                                                                                                                                                                     HSV-2 strain SB5 Contig ID 11 ORF#1 protein
                                                                                                                                                                                                                                                                                                                                                                                               18-DEC-1998
                                                                                                                (SMIK ) SMITHKLINE BEECHAM CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7
                                       1998-286847/25
DB; V62155.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FNDYAA-DCARSPACPLGTDSAQWVNRYHALVDPLVQKP-GKTSDPRGL----SYAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EF-DAYRRDPMADYSPAGVTHVEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQA 219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RFGALLVNPGGPGASAVDMVAAMAPAIAD-TDILRHFDLVGFDPRGVGHSTPALRCRTDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    araaragidwedc---aadwnlpkpiqcgyvtvpmdyakpygkqirlavdrigntgtrse 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tylltgrtdardvtcap 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HYFLDGTLPPTSLRCAP 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tgkglppvlivqserdaatpyegavelhqrfrgsrliterdagshgvtglvnpcindrvd 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APAGAGKVVVVSTTHDPATPYQSGVDLARQL-GAPLIT-FDGTQHTAVFDGNQCVDSAVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ytavectdakwpanwrtwdrdntrlhrdhpfmtwanawmnlp---catwpvkqqtp]nvk 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FNAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPA 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sawaptaeifs---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTGTINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDY--DGRDADGHYS--NDQDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               wkdwqdwvaandaayhlgdtraevqdqwlklraaaakkplggvvgpaelisffqsapyyd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 lgekklnylgvsygtylgavygtlfpdhvrrmvvdsvvnpsrdkiwyqanldqdvafegr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPI--EESISQMAGFQTA 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   efvkapkadpvpg-seadkraqrklareyaegcfersg-emlphmttpntardldviraa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  rqgaliynpggpggsglrfparvtnks avwantakaydfvgfdprgvghsap-iscvdpq\\
                                                                                                                                                                                                                                                                                                        simplex
                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard;
                                                                          Dabrowski-Amaral CE,
Leary JJ;
                                                                                                                                                                                                                                                                                                                                 identification; viral
                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                         virus
                                                                                                                                        97US-0049018
96US-0030279
                                                                                                                                                                              97WO-US20016
                                                                                                                                                                                                                                                                   Location/Qualifiers 780..785
                                                                                                                                                                                                                                                         /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein; 785
                                                                                                                                                                                                                                                      "encoded by
                                                                                                                                                                                                                                                                                                                                 protein inhibitor
                                                                                                                                                                                                                                                                                                                                             response induction;
                                                                                         Delvecchio
                                                                                                                                                                                                                                                        'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -agdtqalvdaaapdlsdtagnasaengnav
                                                                                                                                                                                                                                                        unspecified
                                                                                         ,MA
                                                                                         Dillon
                                                                                                                                                                                                                                                        amino acids"
                                                                                                                                                                                                                                                                                                                                             therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   233
```

SB

```
W7220LT
W7220LT
ID
W7220W
XX
AC
W7
XX
DT
L1
XX
H
KW
H
KW
H
KW
AC
XX
H
XX

                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches 111;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This sequence represents a Herpes simplex virus type-2 (HSV-2) protein sequence of the invention. This sequence was isolated from a HSV-2 straised (SB5) (deposited as ATCC VR-2546) DNA fragment designated Contig ID 11. Based on homology, this sequence is a large tegument protein. Based on the used for the treatment or prevention of disease, to induce an immunological response in a mammal or to identify inhibitors, activators or novel antivirals. Antagonists of the proteins can be used to inhibit a viral polypeptide. The DNA sequence or a vector containing
                                                                                                                                                                       W72204;
                      Herpes
                                                                                                                                       13-JAN-1999
                                                                                                                                                                                                        W72204 standard; Protein; 3119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 442
                                                                                                                                                                                                                                                                                          750
                                                                                                                                                                                                                                                                                                                         442 HPAA-----PAGAGKVVVVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61 IADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDM 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     can also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 AAMWRRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREF 60
                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                            TINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAF-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQ
                                                                                                                                                                                                                                                                                          sppadaalpppafsgsaaafs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----psaptaardprdlaggdggsgpe-----dp-aapparqadpgvlaptlltdattg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLS---YADATTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             vs-----sdietwavgllhtdlnpienaclaaqlprlsa-----liaerpladgp 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VAAMAPAIADTDI-----LRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYS 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tafsreselelcltl----fds----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aaathrtp-aarvtamdlvlaavll---
                                                                                                                                                                                                                                                                                                                                                         qsvptsqyaprpigpaa----taretrpsvppqqntgrvpvaprd----dprpspptp
                                                                                                                                                                                                                                                                                                                                                                                          -NAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGS---APRDLCALWPVPATSTP
                                                                                                                                                                                                                                                                                                                                                                                                                           ---epvpprmwawih----glee-----lasd----daggptpnpapallpppatd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pclvlvdismtpvavlweapeppgppdvrfvgseateelpfvatagdvlaasaadadpff 576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PA-----GVTHVEQVY-------RQLAQDCVDRMGFSFLANIGTASVARDMD--M
                                                                   strain
                                                                                                      strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10;
                    simplex virus type
                                                in SB5; immunological response induction; identification; viral protein inhibitor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Page 82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    785 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   be used to induce an immunological response in a mammal
                                                                                                      SB5
                                                                                                                                      (first entry)
                                                                                                     Contig ID 15 ORF#39 protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       English
                                                                                                                                                                                                                                                                                                                           456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 128; DB 19
Pred. No. 0.0076;
                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -grpfdaslltgelfpghpvyqrpladeag--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -----rpggpdaalrdv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -gapvvv-----alrnt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                   therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                            385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
   Q
                                      밁
                                                              QΥ
                                                                                                     B
                                                                                                                                  δÃ
                                                                                                                                                                       밁
                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This sequence represents a Herpes simplex virus type-2 (HSV-2) protein sequence of the invention. This sequence was isolated from a HSV-2 straised (deposited as ATCC VR-2546) DNA fragment designated Contig ID 15. Based on homology, this sequence is a large tegument protein. The proteins can be used for the treatment or prevention of disease, to induce an immunological response in a mammal or to identify inhibitors, activators or novel antivirals. Antagonists of the proteins can be used to inhibit a viral polypeptide. The DNA sequence or a vector containing it can also be used to induce an immunological response in a mammal.
                                                                                                                                                                                                                                           2470
                                                                                                                                                                                                                                                                                                         2410
                                                                                                                                                                         2504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Herpes simplex virus type-2 sequences - useful in, e.g. prevention and treatment of infection or inducing immunological response in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Chan JY,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       09-JUN-1997;
04-NOV-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                              2335 tafsreselelcltl----fds----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 1998-286847/25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Esser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       31-OCT-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WO9820016-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (SMIK )
                                                                                                                                                                                                                                                                          216
                                                                                                                                                                                                                                                                                                                                         175
                                                                                                                                                                                                                                                                                                                                                                                                           121 VAAMAPATADTDI-----LRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYS 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \vdash
                                                                                                                                                                                                                                                                       VRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQ 275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAMWRRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREF
                                    qsvptsqyaprpigpaa
                                                                                                                                      TINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAF-----
                                                                                                                                                                       ----psaptaardprdlaggdggggpe----
                                                                                                                                                                                                      TAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLS---YADATTG
                                                                                                                                                                                                                                                                                                      pclvlvdismtpvavlweapeppgppdvrfvgseateelpfvatagdvlaasaadadpff 2469
                                                                                                                                                                                                                                                                                                                                         PA-----GVTHVEQVY-----
                                                                                                                                                                                                                                                                                                                                                                          vs-----sdietwavgllhtdlnpienaclaaqlprlsa-----liaerpladgp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDM 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aaathrtp-aarvtamdlvlaavll-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XX.
                                                       -NAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGS---APRDLCALWPVPATSTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SMITHKLINE BEECHAM CORP
                                                                                                   -epvpprmwawih---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Page 127-129; 748pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Dabrowski-Amaral CE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Leary JJ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
   ---PAGAGKVVVVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97US-0049018.
96US-0030279.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97WO-US20016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4.7%;
22.2%;
                                  -----taretrpsvppqqntgrvpvaprd----dprpspptp
                                                                                                     -glee---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 128; DB 19; Pred. No. 0.052;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Delvecchio
                                                                                                                                                                                                                                                                                                                                         RQLAQDCVDRMGFSFLANIGTASVARDMD--M 215
                                                                                                                                                                                                                                      -grpfdaslltgelfpghpvyqrpladeag--
                                                                                                     -lasd----daggptpnpapallpppatd
                                                                                                                                                                     -dp-aapparqadpgvlaptlltdattg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AM,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               166; Indels 182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -gapvvv-----alrnt 2334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dillon
```

Length 3119;

strain

Gaps

25;

60

Š

----rpggpdaalrdv

2409

2642

2552 332 2503

```
δõ
                 DЪ
                                 Ş
                                                   Вþ
                                                                   Ş
                                                                                    В
                                                                                                     20
                                                                                                                        В
                                                                                                                                       QY
                                                                                                                                                                                                                          В
                                                                                                                                                          Query Match
Best Local Similarity
Matches 148; Conserv
                                                                                                                                                                                                                    This sequence is the glucodextranase of Arthrobacter globiformis of the invention. A transformant containing a vector comprising the DNA sequence can be used to prepare glucodextranase efficiently in a short period without the requirement for the addition of expensive dextran.
                                                                                                                                                                                                                                                                 Claim 2; Page 6-7; 9pp; Japanese
                                                                                                                                                                                                                                                                                          Glucodextranase gene, and associated recombinant DNA - useful for preparation of glucodextranase without requirement for additional
                                                                                                                                                                                                                                                                                                                    WPI; 1998-233629/21.
N-PSDB; V19895.
                                                                                                                                                                                                                                                                                                                                                                         30-AUG-1996;
                                                                                                                                                                                                                                                                                                                                                                                          30-AUG-1996;
                                                                                                                                                                                                                                                                                                                                                                                                            17-MAR-1998
                                                                                                                                                                                                                                                                                                                                                                                                                             JP10070981-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Arthrobacter globiformis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Glucodextranase; enzyme; dextran.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Glucodextranase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                              (NORQ ) NORINSUISANSHO (NODA ) ZH NODA SANGYO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      W52304;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      W52304 standard; Protein; 1051
164
                  374
                                  131
                                                   314
                                                                                   254 efslalgfganaeeavntantsvsrgfpkvskdytkewkkylgsldkpakaldgelrtgy
                                                                                                                        194
                                                                    90
                                                                                                      53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
AYRRDPMADYSPA------GVTHVEQVYRQLAQ-----DCVDRMGFSFLANIG
                                                                                                                     pvasalvsssgfsatstgyvgtsdggtdlaadgkldgaypeagpgniaqtgripltgakt 253
                                                                                                                                        PLSSALLS-----FGLLLGGLLLAAP-PLAGATEEPGAG---QTPGAPVVAPQQ 52
                tdaarrgvewlfkygggpdghfpgtskvdgtvggngigldetafpillangigrtdadfy 433
                                                 \tt dvslmtvkahedktfpgawiaslttpwgqvanaeqhregyhavwardmyqsvtallaagd
                                                                   SWNSCREFIADTSEIRTARCATVS-----VPVDY------DQPG------GTQA 89
                                                                                                                                                                                                     1051 AA;
                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                         96JP-0230128
                                                                                                                                                                                                                                                                                                                                                                                          96JP-0230128
                                                                                                                                                                                                                                                                                                                                                                                                                                                       86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein
                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "encoded by CTC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "encoded by CTG"
                                                                                                                                                                 4.5%;
                                                                                                                                                                                                                                                                                                                                              SHOKUHIN SOGO.
KAGAKU KENKYUSHO.
                                 HFDLVGFDPRGVGH-----STPALRC----RTDAEFD 163
                                                                                                                                                        62;
                                                                                                                                                        Score 123; DB 19;
Pred. No. 0.031;
62; Mismatches 219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                          219;
                                                                                                                                                                          Length 1051;
                                                                                                                                                         Indels
                                                                                                                                                         250;
                                                                                                                                                         Gaps
                                                  373
                                                                   130
                                                                                    313
                                                                                                                                                         37;
XAX
                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                   DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
```

```
RESULT 10
W59912
                                                                                                                                                                                                                                                                                                                                                               Peptide
Domain
Gene encoding a mutanase enzyme of plaque and bacteria on teeth
                                                               WPI; 1998-474495/41.
N-PSDB; V53575.
                                                                                                                                                                                                                01-OCT-1997;
                                                                                                                                                                                                                                                                                                  JP10201483-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mutanase enzyme; bacteria; teeth.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              W59912;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      W59912 standard; Protein; 1291
                                                                                                                             (LIOY ) LION CORP.
                                                                                                                                                                       25-NOV-1996;
                                                                                                                                                                                                                                                        04-AUG-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Amino acid sequence of the mutanase enzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20-NOV-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   489 saaiyr-----atadewqrntekwmfttngpvgdgnyylrisgsgnpndgaardwgng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    542 agvhpenavldggflefvrlgvkppadahvadsiae-----tdasisgetpgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       434 akelkpaadylvaagpktpqerweetggyststlasqiaalaaagdiaekng----dvg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        451 KVVVVSTT------HDPATPYQSG-----VDLARQLGAPLITFDGTQHTAVF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                244 FGTHVRAMVLDGAI------DPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           786 aavgsdggtavesrtvlhy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 206 TASVARDMDMVRQALGDD-QINYLGYSYGTK----LGTAYL------ER 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nttvsgttaaakvyvsvngnifeapltpagdgtstfsvdla----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                swama-qyvr----laagikngspvetpknvaqryasgavgkpaltinspaqlttadsa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ngqdalpylatmhsaanqgfmipeqvwdqdeptsyghelgrstg-----saspl 680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---rmw-hry----tydgygekad--gspwdgtgvgrlwpllsgergey----ala
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLLGLQ 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----DGNQCVDS-AVMHY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AWVAADQRIRQVAPFLSYGQFTGS---APRDLCALW-----PVPATSTPHPAAPAGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RGSDAGDLLVLAD-------DYDGRDADGHYSNDQDAFNAVRCVYAPTPADPA 400
                                                                                                                                                                                                                                                                                                                                                                                                                                                   фs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first
                                                                                                                                                                       96JP-0314057
                                                                                                                                                                                                                97JP-0284362
                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
1..31
                                                                                                                                                                                                                                                                                                                                                               306..354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ΡŢ
                                                                                                                                                                                                                                                                                                                                            /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 box; alpha-1,3 glucoside bond; mutan; plaque;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  entry)
                                                                                                                                                                                                                                                                                                                                            "PT box'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A
                        used for prevention and removal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --lpatkntvtv 785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  294
```

This is the amino acid sequence of the mutanase enzyme, compri the a PT box, which decomposes the alpha-1,3 glucoside bond of The mutanase enzyme is used in the method of the invention for

comprising bond of mutan.

Disclosure; Pages 11-14; 15pp; Japanese.

```
밁
                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                         õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SXC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                P.denitrificans COB
                                                                                                                                                                                                                                                                                                        R13498 standard;
                    Thibaut
                             Blanche
                                                                                31-JAN-1990;
                                                                                                         30-JAN-1991;
                                                                                                                               08-AUG-1991
                                                                                                                                                        W09111518-A.
                                                                                                                                                                               Pseudomonas
                                                                                                                                                                                                                                                         25-OCT-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     prevention
                                                       (RHON ) RHONE-POULENC BIOCH
                                                                                                                                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                                                            405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    134
                                                                                                                                                                                                                                                                                                                                                                                          465 YQSGVDLARQLGAPLITFDGTQHTAVFDGNQCVDSAVMHYFLDGTLPPT 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          131 TDILRHFDLVGFDPRGVGHSTPALRCRTDA------EFDAYRRDPMADYSPAGVTH 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181 VEQVYRQLAQDCVDRMGFSFLANIGTASVARDMDMVRQALGDDQINYLGYSYGTKLGTAY 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14 mlmaslltavgpfgpasaaggpnltpgkpitasgqsqtyspqnvkdgnqntywestnnaf 73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         18 LLLGGLLLAAPPLAGATEEPGAGOTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVSV 77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity es 97; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Match
                                                                                                                                                                                                        gene; corrinoid; descobaltocorrinoid; cor gene.
                                                                                                                                                                                                                                                                                                                                                                   pggniaigksisa-----sshtqtyvaenandndvntywegggnpst 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LEREGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPACPLGTDSAQW 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ntvtinf-----tatstryvrlyvtantgwpaaqlsefeiy---gsgdqtpapdty
                                                                                                                                                                                                                                                                                                                                                                                                                                           ADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGAGKVVVVSTTHDPATP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 skte-tlnlnagsn-----tiaykydpgds-gnvnldqitveaststptptp-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         YLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVA 40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VNRYHALVDPLVQKPGKTSDPRGLSYADATTG-----TINALYSPQRWK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pqwiqvdlgastgidqivlklpasweartqtlavqgslngstftdivgsanyvfspsvgn 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P--VDYDQPGGTQAKLAVIRVPATGQ-RFGALLVNPGGPGASAVDMVAA----MAPAIAD 130
                    Ď.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     and
                              Meron B,
                                                                                                                                                                                 denitrificans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                      (first entry)
                                                                                90FR-0001137
                                                                                                        91WO-FR00054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -vnaptagnydvtlrygnatgsnktvslyvngakirqttlpslpnwdsws
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        removal
                                                                                                                                                                                                                                                                                                       Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4.2%;
18.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----gatttfs----
                              Crouzet J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of.
                                                                                                                                                                                                                                                                                                        459
                                                                                                                                                                                                                                                                                                                                                                                                                 sptptptptptp-tptptptptptptptptptptptptp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     plaque and bacteria on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 116; DB
Pred. No. 0.17;
                                                                                                                                                                                                                                                                                                        AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                Debussche
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 195;
                              Ľ,
                                Levy-Schil
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1291;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --hagy----igtgf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels 180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        teeth
                                ŝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                    353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18;
```

```
W72061
  ETT FTT XXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This sequence corresponds to one of 24 polypeptides obtained from p.dentrificans and implicated in the biosynthesis of cobalamines and/or cobamides. COBG is specifically involved in the conversion of precorrin-3 to 5'deoxy-5'-adenosyl cobyrint acid a,c-diamide. It is encoded by part of the 8.7kb EcoRI-EcoRI fragment of plasmid by the color of the state o
                                                           Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                              W72061;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    W72061 standard; Protein; 732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pXL367. The plasmid was isolated from a P.denitrificans bank constructed in vector pXL59. See Q13284-Q13288.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1991-252650/34.
N-PSDB; Q13285.
                                                                                                                                                                                                                                  HSV-2 strain SB5; immunological response induction;
                                                                                                                                                                                                                                                                                       HSV-2 strain SB5 Contig ID 90 ORF#1 protein.
                                                                                                                                                                                                                                                                                                                                                   07-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 17; Fig 16; 299pp; French.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cobalamin, esp. coenzyme B12 prodn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 New polypeptide(s) involved in cobalamin and cobamide biosynthesis - and DNA encoding them, for amplifications
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  341 QRWKYLTSGLLG--LORGSDAGD 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22 GLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIADTSEIRTARCATVSVPVDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          engmgsalarlgrlvrqnkdage 438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           lvetapelldgsltvhlsgcakgcarpkpseltlvgapsg--yglvvngaanglpsaytd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LVQ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --glcpetaavaqslaashgfriaeqdprnaiatcagskgc----asawmet-kgmaer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DGAIDPAVSPIEESISQMAGFQTAFND---YAADCARSPACPLGTDSAQWVNRYHAL.VDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       glglaf-aqveaaalasylhqv-qalganairlapghaf---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RMGFSFLANIGTASVARDMDMVRQALGDDQINYL-GYSYGTKLGTAYLERFGTHVRAMVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     slgttmrgrdldpseiralcrcetsse----rpaaprsaa----ipgihalgnadtvl 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LVGFDPRG----VGHSTPALRCRTDAEFDAYRRDPMADYSPAGVTHVEQVYRQLAQDCVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggrfglgavvadirlqavstvagvawvlslggtstkassvgtlagnavvpalitilekla
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DQPGGTQAKLAVIRVPATGQRFG-ALLVNPGGPG--ASAVDMVAAMAPAIADTDILRHFD 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    glaievpplagidpdeiadprpia-----telreal-dvrqvplklapklsvvids 155
                                                                                                                                              simplex virus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                       identification; viral protein inhibitor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 459 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                     Location/Qualifiers
667
  691
                             'note= "unspecified
                                                                                                                                              type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4.1%; Score 113.5; DB 23.2%; Pred. No. 0.068; Live 49; Mismatches 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---KPGK---TSDPRGLSYADATTGTINAL---YSP
                             amino acid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for amplification
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        152;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                     therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               genomic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --- [V]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            357
```

20;

```
В
                                                                                                                                   В
                                                                                                                                                                                         밁
                           밁
                                                 Qy
                                                                                                         Q
                                                                                                                                                             δÃ
                                                                                                                                                                                                                QY
                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                    Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This sequence represents a Herpes simplex virus type-2 (HSV-2) protein sequence of the invention. This sequence was isolated from a HSV-2 stra: SB5 (deposited as ATCC VR-2546) DNA fragment designated Contig ID 90. Based on homology, this sequence is a large tegument protein.

The proteins can be used for the treatment or prevention of disease, to induce an immunological response in a mammal or to identify inhibitors, activators or novel antivirals. Antagonists of the proteins can be used to inhibit a viral polypeptide. The DNA sequence or a vector containing it can also be used to induce an immunological response in a mammal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Herpes simplex virus type-2 sequences - and treatment of infection or inducing i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-PSDB; V62145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Esser KM,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Chan JY,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                09-JUN-1997;
04-NOV-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31-OCT-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14-MAY-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO9820016-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (SMIK ) SMITHKLINE BEECHAM CORP
 386
                            611
                                                      333
                                                                                 562
                                                                                                            276
                                                                                                                                      528
                                                                                                                                                               216
                                                                                                                                                                                           468
                                                                                                                                                                                                                      175
                                                                                                                                                                                                                                                 423
                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                      393
                                                                                                                                                                                                                                                                                                                                                            358
                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                    Н
                                                                                                                                                                                                                                                                                                                            IADTSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDM 120
                                                                                                                                                                                                                                                                                                                                                         aaathrtp-aarvtamdlvlaavll---
                                                                                                                                                                                                                                                                                                                                                                                    AAMWRRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREF 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1998-286847/25.
                         ---epvpprmwawi-hgl-----
                                                                                              TAFNDYAADCARSPACPLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLS----YADATTG
                                                                                                                                                                                                                      PA-----GVTHVEQVY
                                                                                                                                                                                                                                             vs----sdietwavgllhtdlnpienaclaaqlprlsa----
                                                                                                                                                                                                                                                                         VAAMAPAIADTDI-----LRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYS 174
                                                                                                                                                                                                                                                                                                      tafsreselelcltl----fds---
 -NAVRCVYAPTPADPAAWVAADQRIRQVAPFLSYGQFTGS---APRDLCALWPVPATSTP
                                                    TINALYSPQRWKYLTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAF-----
                                                                                                                                                              VRQALGDDQINYLGYSYGTKLGTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQ
                                                                                                                                                                                         pclvlvdismtpvavlweapeppgppdvrfvgseateelpfvatagdvlaasaadadpff
                                                                              ----psaptaardprdlaggdggsgpe-----dp-aapparqadpgvlaptfltdattg
                                                                                                                                                                                                                                                                                                                                                                                                                 103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Dabrowski-Amaral CE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Page 63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Leary JJ;
                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               97US-0049018.
96US-0030279.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97WO-US20016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note=
732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note=
                                                                                                                                                                                                                                                                                                                                                                                                                           4.18; 21.28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               748pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "unspecified amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "encoded by
                                                                                                                                                                                                                                                                                                                                                                                                               42;
                                                                                                                                                                                                                                                                                                                                                                                                                            Score 111; DB Pred. No. 0.22;
                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Delvecchio
                                                                                                                                                                                                                   -RQLAQDCVDRMGFSFLANIGTASVARDMD--M
                                                                                                                                   -grpfdaslltgelfpghpvyqrpladeag--
                         -eelasedaggptpnpapallpppatd

    useful in, e.g. prevention
immunological response in

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   acid"
                                                                                                                                                                                                                                                                                                                                                         -----gapvvv-----alrnt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ΑM,
                                                                                                                                                                                                                                                                                                                                                                                                                                         19;
                                                                                                                                                                                                                                                                                                                                                                                                               165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Dillon
                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 732;
                                                                                                                                                                                                                                                                                                                                                                                                               Indels 176;
                                                                                                                                                                                                                                             --liaerpladgp
                                                                                                                                                                                                                                                                                                 -rpggpdaalrdv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SB
                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
 441
                                                                                                                                                                                                                                                                                                    422
                                                                               610
                                                                                                                                                                                           527
                                                                                                                                                                                                                   215
                                                                                                                                                                                                                                               467
                                                                                                                                                                                                                                                                                                                                                          392
                           650
                                                    385
                                                                                                         332
                                                                                                                                    561
                                                                                                                                                               275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          strain
                                                                                                                                                                                                                                                                                                                                                                                                               23;
```

```
RESULT
W22607
망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Db
W22606-W22610 represent proteins encoded by the platenolide synthase cluster. The gene cluster is also referred to as the srmG gene, and \kappa
                                           DNA encoding Streptomyces fradiae tylactone synthase domain production of tylosin-related polyketide compounds
                                                                                                                                                                      27-AUG-1997
                                                                                                                                                                                                                  Domain
                                                                                                                                                                                                                                                                       Doma i n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Tylactone synthase gene cluster; tylG gene; multifunctional protein; polyketide; tylactone synthesis; antibiotic; tylosin.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Platenolide synthase ORF2 protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            27-FEB-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               W22607;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                W22607
                          Example 2; Pages
                                                                      N-PSDB; T80414.
                                                                                               Dehoff BS,
                                                                                                                (ELIL ) LILLY & CO ELI.
                                                                                                                                   22-FEB-1996;
                                                                                                                                                    19-FEB-1997;
                                                                                                                                                                                       EP791655-A2
                                                                                                                                                                                                                                    Domain
                                                                                                                                                                                                                                                     Domain
                                                                                                                                                                                                                                                                                        Domain
                                                                                                                                                                                                                                                                                                         Domain
                                                                                                                                                                                                                                                                                                                          Domain
                                                                                                                                                                                                                                                                                                                                            Domain
                                                                                                                                                                                                                                                                                                                                                              Domain
                                                                                                                                                                                                                                                                                                                                                                                Domain
                                                                                                                                                                                                                                                                                                                                                                                                 Domain
                                                                                                                                                                                                                                                                                                                                                                                                                  Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                    Modified-site
                                                                                                                                                                                                                                                                                                                                                                                                                                              Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            701 sppada 706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13
                                                                             1997-418046/39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HPAAPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              qsvptsqyaprpigpax-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               447
                                                                                               Kuhstoss
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ambofaciens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first
                                                                                                                                   96US-0012078
                                                                                                                                                    97EP-0301056
                                                                                                                                                                                                                                                                                                                                                                                /note=
942..1(
                                                                                                                                                                                                                                                                                                                                                                                                /note= "J
525..882
                                                                                                                                                                                                                  /note= "ke
4374..4457
                                                                                                                                                                                                                                   4083..4268
                                                                                                                                                                                                                                                     3546..3727
                                                                                                                                                                                                                                                                                                                                                                                                                  /note=
15..418
                         149-155; 220pp; English
                                                                                                                                                                                                                                                                      3184..3520
                                                                                                                                                                                                                                                                                         2641..3064
                                                                                                                                                                                                                                                                                                         2533..2616
                                                                                                                                                                                                                                                                                                                           2232..2416
                                                                                                                                                                                                                                                                                                                                            1596..1953
                                                                                                                                                                                                                                                                                                                                                    /note= "ketosynthase
                                                                                                                                                                                                                                                                                                                                                            1060..1483
                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                             /note-
                                                                                                                                                                                                                                                              /note=
                                                                                                                                                                                                                                                                                /note=
                                                                                                                                                                                                                                                                                                /note=
                                                                                                                                                                                                                                                                                                                  'note=
                                                                                                                                                                                                                                                                                                                                     /note=
                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein; 1996
                                                                                                                                                                                                                                                                                                                                                                                                                  .418
                                                                                                                                                                                                                                                                                                                                                                              te= "acyltransferase domain, AT(s)"
..1025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entry)
                                                                                               SA,
                                                                                                                                                                                                                                                                                                                                                                                                        "ketosynthase domain,
                                                                                                                                                                                                                                                                                                                                                                                                                           "encoded
                                                                                                                                                                                                        "acyl carrier protein domain,
                                                                                                                                                                                                                           "ketoreductase domain,
                                                                                                                                                                                                                                                                                                "acyl carrier
                                                                                                                                                                                                                                                                                                                  "ketoreductase domain, KR1"
                                                                                                                                                                                                                                                            "acyltransferase domain, AT2"
                                                                                                                                                                                                                                            "dehydratase domain,
                                                                                                                                                                                                                                                                                                                                  "acyltransferase domain, AT1"
                                                                                                                                                                                                                                                                                                                                                                     "acyl carrier protein domain, ACP(s)"
                                                                                                                                                                                                                                                                              ketosynthase
                                                                                                Rosteck
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -taretrpsvppqqntgrvpvapr---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                          bу
                                                                                               PR,
                                                                                                                                                                                                                                                                                                                                                                                                                           GTG"
                                                                                                                                                                                                                                                                                                protein domain,
                                                                                                                                                                                                                                                                              domain,
                                                                                                                                                                                                                                                                                                                                                     domain,
                                                                                               Sutton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         =
                                                                                                                                                                                                                                                                               KS2"
                                                                                                                                                                                                                                                                                                                                                     KS1"
                                                                                                                                                                                                                                                                                                                                                                                                        KS'(S)"
                                                                                                KL;
                                                                                                                                                                                                                           KR2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ξ
                                                                                                                                                                                                         ACP2"
                                                                                                                                                                                                                                                                                                ACP1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -xdprpspptp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               700
       gene
```

```
RESULT 14
W23717
ID W23717
XX
AC W23717
XX
AC W23717
XX
DT 27-FEB
XX
                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CC isolated from Streptomyces ambofaciens. These sequences are CC multi-functional proteins which direct the synthesis of the polyketide CC platenolide. Platenolide is the basic building block of the macrolide CC antibiotic spiramycin. The DNA encoding this sequence was used along with the tyle gene (see T80413) to create a hybrid ORF1 sequence (see T80415). CC The tyle gene is the tylactone synthase gene cluster of the invention. CC The tyle gene is the tylactone synthase gene cluster of the polyketide CC tylosin. The hybrid sequence can be used to transform S. ambofaciens CC tylosin. The hybrid sequence, or S. fradiae lacking the tyle ORF1 conductions of the synthase gene cluster of the polyketides. CC lacking the srmG ORF1 sequence, or S. fradiae lacking the tyle ORF1 conduction sequence, so that they can produce polyketides. The DNA sequence can be completed so as to alter the type of carboxylic acids incorporated, the conductions performed, thereby resulting in novel tylosin-related constructions performed, thereby resulting in novel tylosin-related
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 134;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      uery Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1541
                            27-FEB-1998
                                                                                                              W23717
                                                                                                                                                                                                                   1859 avdlrnrln----trtglrlpatlvfd--hptplalaellldg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1718 rvrrsglapldagaaldlldraltrpepallpvrldlraaag-atalpevlrdlagvpa-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1426 aagpeggaadpagaavwglvrvaqaeqpgrftlvdvdgtqaslralpgllatdagqsavr 1485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                          468 GVDLARQLGAPLITFDGTQ--HTAVFDGNQCVDSAVMHYFLDG
                                                                                                                                                                                                                                                                                                                                              412 VAPFLSYGQFTG-SAPRDLCALWPVPATSTPHPAAPAGAGKVVVVS---TTHDPATPYQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  26 AAPPLAGATEEPGA------GQTPG----APVVAPQQSWNSCREFIADTSEIRTAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                  GLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pdehpltcvvhtagvlddgvlsaqtaeridtvlrpkadaavhldeltreigr-•vplvly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YLERFG-----THVRAMVLDGAI---DPAVSPIEESISQMAGFQTAFNDYAADCARSPAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ssvsatlgsaggagyaaanafmdalaarrcaaghpals-lgwgwwsgvglatgldgadaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SFL-ANIGTASVA-----RDMDMV---RQALGDDQINYLGYSYGTKLG-----TA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADYSP-----AGV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 arhlvdrhkvrhlllvgrrgpdapgvdrlvaeltesgaevavracdvtdrdalrrlldal\\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APAIADTDILRHFDLVGF---DPRGVGH-----STPALRCRTDAEFDAYRR--DPM 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     dgrvtvprlvpvadpvphgggtaadgtgagepsatldpegtvlit-ggtga----laaet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CATVSVP--VDYDQP----GGTQAKLAVIRVP-ATGQRFGALLVNPGGPGASAVDMVAAM 124
                                                                                                              standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1996 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                          (first entry)
                                                                                                                                                                                                                                                                                                      -rlagrsapertallldlvrtev--
                                                                                                              Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----darstpgaaagtg---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4.0%;
                                                                                                              1996
                                                                                                                                                                                                                                                                                                                                                                                      -dedg-----avr--papapadaagtlaa-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; Score 108.5;
; Pred. No. 1.5;
50; Mismatches
                                                                                                              A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----THVEQVYRQLAQDCVDRMGF 198
                                                                                                                                                                                                                                                                                                    -aavlghgdpaaigaartfkdagfdslt 1858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              186;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              213;
                                                                                                                                                                                                                                                                                                                                                                                          1809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              32;
```

```
δÃ
                                                                                    В
                                                                                                                                            밁
                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                W23716-W23720 represent proteins encoded by the platenolide synthase gene cluster of the invention. The gene cluster is also referred to as the srmG gene, and was isolated from Streptomyces ambofaciens. These sequences are multi-functional proteins which direct the synthesis of the macrolide antibiotic spiramycin. The DNA can be used to produce compounds exhibiting antibiotic activity based on the platenolide structure, including specifically the macrolide antibiotic spiramycin and spiramycin analogues and derivatives. Modifications of the platenolide synthase DNA sequence can be made so as to change the number and type of carboxylic acids incorporated into the growing polyketide chain and to change the kind of post-condensation processing that is conducted.
                                                                                    1486
                                                                                                                                         1426 aagpeggaadpagaavwglvrvaqaeqpgrftlvdvdgtqaslralpgllatdagqsavr 1485
                         1541 arhlvdrhkvrhlllvgrrgpdapgvdrlvaeltesgaevavracdvtdrdalrrlldal 1600
                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 1997-418047/39
N-PSDB; T78508.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rosteck
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Burgett
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (ELIL ) LILLY & CO ELI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22-FEB-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19-FEB-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  27 - AUG - 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EP791656-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Кеу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            multi-functional protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Platenolide synthase gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Platenolide synthase ORF2
171 ADYSP---
                                                                                                                 72
                                                                                                                                                                       26 AAPPLAGATEEPGA------GQTPG----APVVAPQQSWNSCREFIADTSEIRTAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           encoding Streptomyces ambofaciens platenolide synthase domain production of spiramycin-related polyketide antibiotics
                                                                                                              CATVSVP--VDYDQP----GGTQAKLAVIRVP-ATGQRFGALLVNPGGPGASAVDMVAAM 124
                                                                                 dgrvtvprlvpvadpvphgggtaadgtgagepsatldpegtvlit-ggtga----laaet 1540
                                                      APAIADTDILRHFDLVGF - - - DPRGVGH - -
                                                                                                                                                                                                       134;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8; Pages 48-54; 81pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SG,
                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                            1996
                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Kuhstoss SA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ambofaciens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        96US-0012050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97EP-0301066
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "ac
957..1155
 -AGV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note= "ketoreductase domain,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1523..1707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "dehydratase domain, DH3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            582..933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ocation/Qualifiers
                                                                                                                                                                                                                   4.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "acyl carrier protein domain,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "ketosynthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cluster; platenolide production; srmG macrolide antibiotic; spiramycin.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein
                                                                                                                                                                                                     50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rao
                                                                                                                                                                                                    score 108.5;
Pred. No. 1.5;
50; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Richardson MA;
                                                      --STPALRCRTDAEFDAYRR---DPM 170
                                                                                                                                                                                                                                 DB 18;
                                                                                                                                                                                                     186;
-THVEQVYRQLAQDCVDRMGF 198
                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACP3"
                                                                                                                                                                                                     213;
                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene,
                                                                                                                                                                                                     32;
```

```
RESULT 15
Y00138
ID Y00138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ДĎ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                     14-NOV-1997;
06-MAY-1997;
16-MAY-1997;
         The present sequence represents a protein isolated from Enterococcus faecalis. The present invention describes genes, proteins can and antigenic polypeptides isolated from E. faecalis. The proteins can be used in vaccines for preventing or attenuating an infection caused by a member of the Enterococcus genus in an animal. They can also be used for detecting Enterococcus antibodies in a sample. The nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1601
sequences can
                                                                                                    Claim 9;
                                                                                                                         New isolated Enterococcus faecalis polynucleotides - used products for the detection of Enterococcus and for use in for prevention or attenuation of Enterococcus infection
                                                                                                                                                                             N-PSDB;
                                                                                                                                                                                                                                                                                                                         04-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                   12-NOV-1998
                                                                                                                                                                                                                                                                                                                                                                            WO9850554-A2
                                                                                                                                                                                                                                                                                                                                                                                                     Enterococcus
                                                                                                                                                                                                                                                                                                                                                                                                                           Enterococcus faecalis;
detection; attenuation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Enterococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Y00138
                                                                                                                                                                                                                                            (HUMA-) HUMAN GENOME SCI INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20-APR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Y00138 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     468 GVDLARQLGAPLITFDGTQ--HTAVFDGNQCVDSAVMHYFLDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  199
                                                                                                                                                                              1999-070095/06
DB; X20128.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            avdlrnrln----trtglrlpatlvfd--hptplalaellldg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VAPFLSYGQFTG-SAPRDLCALWPVPATSTPHPAAPAGAGKVVVVS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPTPADPAAWVAADQRIRQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    {\tt rvrrsglapldagaaldlldraltrpepallpvrldlraaag-atalpevlrdlagvpa-}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YLERFG----THVRAMVLDGAI---DPAVSPIEESISQMAGFQTAFNDYAADCARSPAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ssvsatlgsagqagyaaanafmdalaarrcaaghpals-lgwgwwsgvglatgldgadaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PLGTDSAQWVNRYHALVDPLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKYLTSGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SFL-ANIGTASVA-----RDMDMV---RQALGDDQINYLGYSYGTKLG-----TA
                                                                                                                                                                                                                   c,
                                                                                                  Page 154;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----rlagrsapertallldlvrtev---aavlghgdpaaigaartfkdagfdslt 1858
                                                                                                                                                                                                                    Choi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                     faecalis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    faecalis protein
be used for detecting
                                                                                                                                                                                                                                                                     97US-0066009.
97US-0044031.
97US-0046655.
                                                                                                                                                                                                                                                                                                                        98WO-US08959
                                                                                                                                                                                                                   GH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Protein;
                                                                                                  301pp; English.
                                                                                                                                                                                                                   Hromockyj
                                                                                                                                                                                                                                                                                                                                                                                                                                          infection;
                                                                                                                                                                                                                                                                                                                                                                                                                              antigenic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -dedg-----avr--papapadaagtlaa-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EF068
                                                                                                                                                                                                                   A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    darstpgaaagtg----
                                                                                                                                                                                                                                                                                                                                                                                                                                          vaccine;
                                                                                                                                                                                                                    Kunsch
Enterococcus
                                                                                                                                                                                                                   CA;
                                                                                                                                                                                                                                                                                                                                                                                                                                         immune response; diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1895
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     508
nucleic acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -TTHDPATPYQS
                                                                                                                                                    to
                                                                                                                                         vaccines
                                                                                                                                                    develop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 291
```

```
Дb
                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SSSSS
                                                         В
                                                                                      Qy
                                                                                                                     B
                                                                                                                                              Qy
                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Products from the present invention can also be used compounds to identify agonists and antagonists of {\tt E.} activity.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
   414
                               450
                                                                                                                      315
                                                                                                                                                 346
                                                                                                                                                                              276
                                                                                                                                                                                                          292
                                                                                                                                                                                                                                     231
                                                                                                                                                                                                                                                                  237
                                                                                                                                                                                                                                                                                               178
                                                                                                                                                                                                                                                                                                                          183
                                                                                                                                                                                                                                                                                                                                                       125
                                                                                                                                                                                                                                                                                                                                                                                  124
                                                                                                                                                                                                                                                                                                                                                                                                               75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         18
                                                                                                                                                                                                                                                                                                                                                                                                                                            64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4
netltavaknasgtextpttfqtpadea-tvtaptitgvtgnstagyevkgtada
                   gyevkgtadanatv----eirnag
                                                                                                                                                                             pllavggsgvne---lvdasllgtttvtlpttvstpqnls----
                                                                                                                                                                                                                                                                                            evnrql--elvnn----ienlgaasftapetlaadgsyisapisdglglvlaqnysnil
                                                                                                                                                                                                                                                                                                                       QVYRQLAQDCVDRMGFSFLANIGTAS -----VARDMDMVRQALGDDQINYLGYSYGTKL
                                                                                                                                                                                                                                                                                                                                                  agsaaintnvtidlskvtf------ltavlnaandltnvitgitsgalgnltgvdidlt 177
                                                                                                                                                                                                                                                                                                                                                                               MAPAIADTDILRHFDLVGFDPRGVGHSTPALRCRTDAEFDAYRRDPMADYSPAGV-THVE 182
                                                                                                                                                                                                                                                                                                                                                                                                                             TSEIRTARCATVSVPVDYDQPGGTQAKLAVIRVPATGQRFGALLVNPGGPGASAVDMVAA 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       wtkrkmlnlaissgllftsl---aipvsiavtsgtisasaavldiellsnvtsnndsgts 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WRRRPLSSALLSFGLLLGGLLLAAPPLAGATEEPGAGQTPGAPVVAPQQSWNSCREFIAD
                                                                                      -----PADPAAWVAADQRIRQVAPFLSYGQFTGSAPRDLCALWPVPATSTPHPAAPAGA 449
                                                                                                                   ldarfvgtvvqtdlldvnlla-----tadg-vsniyfaagttsevtaptitgvtgnsta
                                                                                                                                                LTSGLLGLQRGSDAGDLLVLADDYDGRDADGHYSNDQDAFNAVRCVYAPT-----
                                                                                                                                                                                                       PLGTDSAQWVNRYHALVD-----PLVQKPGKTSDPRGLSYADATTGTINALYSPQRWKY 345
                                                                                                                                                                                                                                     qdlnaavqaleakgtsipsnlvaaainaallpvkgtv------nvavsgal
                                                                                                                                                                                                                                                               ----GTAYLERFGTHVRAMVLDGAIDPAVSPIEESISQMAGFQTAFNDYAADCARSPAC 291
                                                                                                                                                                                                                                                                                                                                                                                                            tsnrwta--angngpvnftvsggaladasav---fsggkgavlvvppelrg----nvaa 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 108;
Pred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ced. No. 1.2;
Mismatches
                                                         -gtvigtgtadgtgaftvtv----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 229;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1638;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for screening faecalis prot
                                                         -pageaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 124;
                              499
   467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein
                                                                                                                                                                             nn-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                            413
                                                                                                                     367
                                                                                                                                                                             314
                                                                                                                                                                                                                                     275
                                                                                                                                                                                                                                                                                             230
                                                                                                                                                                                                                                                                                                                         236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    63
                                                                                                                                                 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22;
```

Search completed: January 5, 2001, 14:26:37 Job time: 194 sec

ne menos de la companya de la compa

em_esthum3:*
em_esthum4:*
em_esthum5:*

em_esthum2

em_esthum6:*
em_esthum7:*
em_esthum8:*
em_esthum9:*

```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OM nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tal number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB
DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nucleic search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              length:
length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              : Minimum I
Maximum
Listing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hits satisfying
           1110
1110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
11110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
1110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EST:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDENTITY_NUC Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-461-774-5
903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            January 12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7991742 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version
Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gattacgaacaggactggga.....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gb_est1: *
gb_est2: *
gb_est4: *
gb_est5: *
gb_est5: *
gb_est5: *
gb_est6: *
gb_est7: *
gb_est10:
    gb_est11:
    gb_est11:
    gb_est11:
    gb_est14:
    gb_est14:
    gb_est15:
    gb_est15:
    gb_est16:
    gb_est18:
    gb_est18:
    gb_est120:
    gb_est21:
    gb_est21:
    gb_est22:
    gb_est23:
    gb_est24:
    gb_est25:
    gb_est26:
    gb_est27:
    gb_est27:
    gb_est27:
    gb_est27:
    gb_est27:
    gb_est28:
    gb_est29:
    gb_est31:
    gb_est31:
    gb_est31:
    gb_est32:
    gb_est33:
    gb_est34:
    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gb_est9:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
20000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      n Match 0%
n Match 100%
g first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2001, 18:01:32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3503743858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         chosen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14.5
Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Search time 3358.72 Seconds (without alignments) 1883.980 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .aggagagggtgaaagcttaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15983484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         903
```

em_estro6:*
em_estro7:*
em_estro8:*

em_estro2:*
em_estro3:*
em_estro4:*
em_estro5:*

em_estrol:*

em_estov2:*
em_estpl1:*
em_estpl2:*
em_estpl3:*
em_estpl4:*
em_estpl5:**

em_estin4:*
em_estov1:*

em_estin3:*

em_esthum10: em_esthum11: em_esthum13: em_esthum13: em_esthum14: em_esthum16: em_esthum16: em_esthum19: em_esthum20: em_esthum20: em_estin1:*

: em_estro10: *
 em_estro11: *
 em_estro11: *
 em_estro11: *
 em_estro11: *
 em_estro12: *
 em_estro13: *
 em_estro13: *
 epb_est44: *
 gb_est44: *
 gb_est44: *
 gb_est44: *
 gb_est51: *
 gb_est51: *
 gb_est52: *
 gb_est52: *
 gb_est53: *
 gb_est51: *
 gb_est51: *
 gb_est52: *
 gb_est53: *
 gb_est53: *
 gb_est53: *
 gb_est53: *
 gb_est53: *
 gb_est53: *
 gb_est51: *
 gb_est51: *
 gb_est51: *
 gb_est53: *

em_estom2:*

```
117: em_estpl6:*
119: em_estpl0:*
119: em_estpl0:*
120: em_estr014:*
121: em_estr014:*
122: em_estr015:*
123: em_estr015:*
124: em_estr017:*
125: em_estr019:*
126: gb_est69:*
127: gb_est69:*
138: gb_est61:*
139: gb_est61:*
131: gb_est61:*
131: gb_est61:*
131: gb_est61:*
132: gb_est61:*
133: gb_est61:*
134: gb_est61:*
135: gb_est61:*
136: gb_est61:*
137: gb_est61:*
138: gb_est61:*
139: gb_est61:*
140: gb_est61:*
141: gb_est61:*
142: gb_est61:*
143: gb_est77:*
138: gb_est77:*
139: gb_est81:*
144: gb_est81:*
145: gb_est81:*
146: gb_est81:*
147: gb_est81:*
149: gb_est81:*
150: gb_gss1:*
151: em_gss1:*
152: em_gss1:*
153: em_gss1:*
164: em_gss1:*
165: em_gss1:*
167: em_gss1:*
168: gb_gss1:*
179: em_gss1:*
179: gb_gss1:*
179: em_gss1:*
1
```

ω	Ν	191:	
ss28:	ss27 :	gb_gss26:*	SS25:

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

				•			•																																				
.4.		4 4		c 40	c 39		c 37			34				c 30					25	24	23	22		c 20	19	19 19	C 15		0 14		12	11		o (ი 5	ი 4	w	2	-ب	Result No.
34.2	٠.	34.4	34.4	34.4	34.6	34.	34.	ω	ω	ω	ω	ω	w	ω	w	ω	ω	ω	35.	35.	ა ა	ω :	ω 5	35.	ω u	J L		Ju	ى د م م	· w	ω	36.	36.	36.6	٠,	σ:	5	7	7	0		78.8	Score
	ب ص		ა დ ი თ	υ ω 0 00		3.9	3.9			3.9	•	3.9		3.9			3.9		3.9	٠	3. 9				ים. סי			•	4.	. 4	4.0	4.0		4.1	4	4.1	4.1	4.2	4.2	4.5	4.	8.7	Query Match
503	1020	67,4	000	542	661	1054	395	816	584	483	475	452	442	440	438	435	403	340	910	543	689	584	539	1063	50 7	704 1104	1150	467	465	439	416	673	849	484	7	477	249	0	7	925	w	340	Length [
105 E			•		м															Ä			⊳										~					190 0	Α		193 P	7 AA4	DB ID
BE215761	CNS007F0	5E4 15054	1153/198	3E415790	E4 05	NS05KI	BE417757	BE188063	BE405684	3E416589	AW983152	3E426473	3E416187	BE417801	3E400743	BE517717	BE606633	3E417796	CNS006ON	090556	3E905873	3E388729	AW672855	CNS043SG	BE586256	CNSCHOOL	CNEO15YB	SE000099	AQUSTAN	10846629	BE416649	AU090557	1926475	BE416420	F415878	BE417569		7	AW982729	~ '	92	165061	
BE	AT P	p 0	ALG	, BE	BE	AI	81	38	ВЕ	38	AWS	ВІ	18	ВЕ	BE	BE	81	38	ΑI	AUC	BE	ВЕ	AWE	AI.	B .		2 1		1 AC	A	ВЕ	AUC	AWS	8	P	ВЕ	7	ΑI	AW9	AI	ΑI	AA46	Desc
	AL067513 D	U #	σ			AL341522 T				€416589 №	983152 HV	3426473 W	E416187 N	E417801 M	£400743 P	2517717 W	2606633 W	BE417796 N	AL065629 E)90556 AU	1905873 6	388729 6	AW672855 ba		BE586256 W			24 15000	AQ851993 L		4	7	I		78	إ ف	SS	108460	82729	<u>u</u>	390626	5061 EST	escription
HV_CEDOOO	Drosophil	MUGOOL.GO	PUSCOSBIT	MUG001.A1	WHE1212_G	Tetraodon	MUG024.B1	CFC341-R	WHE1214_B	MUG009.C0	SMEG000	3 WHE0335_C	1UG005.E1	MUG024.G0	WB007.B0	7HE0802_F	ие0901_с	MUG024.G0	Drosophil	AU090556	01495531	9 601286392	50e08.y	Tetraodon	WHE501 BO	TT-M-AHO-	Mocoon Bo	MEI/OI-I	LMAJEVI_I	LMAJEV1_1	MUG009.H0	AU090557	SMEGOOO	MUG008.E0	MIIGOO2. AO	MUG022.D0	SC9C08 Por	Drosophil	HVSMEG000	Drosophil	Leishmani	Alonz	

ALIGNMENTS

RESULT 1
AA465061
AA465061
AA465061
AA465061
AA465061
AA465061
AA465061
AA465061
AA465061
VERSION
AA465061.1
GI:2191201

AA465061
AEST
AA465061.1
GI:2191201

ř

```
JOURNAL
MEDLINE
COMMENT
                                 δÃ
                                                                                                    ρy
                                                                                                                                               Ф
                                                                                                                                                                               ρ
                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                                                                                                                                    QΥ
д
                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
313
                                     578
                                                                        259
                                                                                                            518
                                                                                                                                                 199
                                                                                                                                                                                       458
                                                                                                                                                                                                                          139
                                                                                                                                                                                                                                                              398
                                                                                                                                                                                                                                                                                                                                          338
                                                                                                                                                                                                                                                                                                                                                                                                   79
                                                                                                                                                                                                                                                                                                                                                                                19
TGTATCACGATATGGGCCTGATTCTCGG
                     tctaccacgacatgggtttggtaatagg 605
                                                                                                        actitgcggataccgacgggattccaccgccaaattccgcactcgtatcctggctaccct
                                                                                                                                                 CCGGAGTCATTGTGTCGCACACGAATGTCATTGCCAATGTGACACAAAGTATGTACGGCT
                                                                                                                                                                                 ctggcgtggtgatgtcccatcagaacgttcgggttaatttcgaacagctgatgtctggct
                                                                                                                                                                                                                          CTCGTCAGCACCCGGGGCGGCTTATCTCCAATACACGTCCGGATCGACGCGTACGCCGG
                                                                                                                                                                                                                                              aagacgagtatccatctaccgcgtatttgcaatacacctccggggtccaccccgcacgcccg
                                                                                                                                                                                                                                                                                                                                                                              ATTTCGGCGATCCCGCAAAGATTCCGACCGGGA---
                                                                                                                                                                                                                                                                                                     CGGTCGTAGTTGAGGTTGATCTGCTTTGATTTTGGACTCGCCGCGACAGATGCCCGCCTTTCT
                                                                                                                                                                                                                                                                                                                                    catcaattatcgaagttgatttgctcgatctggacgctccgaatgggtataccttcaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           University of Berne
DKF, Tiefenaustr. 120, :
Tel: ++41 31 308 80 28
Fax: ++41 31 308 80 28
Email: pimboden@imm.unik
                                                                                                                                                                                                                                                                                                                                                                                                                                                         180;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gene 213 (1-2), 107-117 (1998)
98296259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 (bases 1 to 340)
Imboden, P. and Schoolnik, G.K.
Construction and characterization of a partial Mycobacterium tuberculosis cDNA library of genes expressed at reduced oxygen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Firmicutes; Actinobacterineae; Mycobacteriaceae; Mycobacterium
Actinomycetales; Corynebacterineae; Mycobacterium
; Mycobacterium tuberculosis complex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           see also GenBank Accession
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Research
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Contact: Paul Imboden
Institute for Medical Microbiology at the Department of Clinical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Saframycinsynthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    : Length:
1 row:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pimboden@imm.unibe.ch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="Vector: pEr24a (+) (Novagen); Site_1: EcoR1; Site_2: EcoR1; total RNA isolated from liquid cultures grown to late log phase in Middlebrook 7H9/ADC in an atmosphere of 5% oxygen, 5% CO2 and 90% Nitrogen. Random fragments were amplified from total RNA by rPCR with the primer UPN6 (5'-GCCGGAGCTCTGCAGATTCNNNNNN-3') and cloned into EcoR1 site of pET24a (+). Clones from M.tb ribosomal RNA were detected by hybridization and removed."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /clone_lib="Mtb FOX (5% oxygen) expression library"
/dev_stage="late log phase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Mycobacterium tuberculosis"
/strain="PI, ATCC 51910"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /lab_host="Escherichia coli strain Novablue (Novagen)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /clone="Alonzo"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  row: H column:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Std Error:
olumn: 6.
                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 78.8; DB 7; Pred. No. 2.1e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3004 Berne,
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches 142;
340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Number U64610;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Switzerland
                                                                          -CTGTGGTGTCGTGGCTGCCTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 340;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                       6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     oxygen
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                          577
                                                                                                                                                                                   517
                                                                                                                                                                                                                          198
                                                                                                                                                                                                                                                              457
                                                                                                                                                                                                                                                                                                     138
                                                                                                                                                 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                       1;
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LOCUS
DEFINITION
                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
P929R
                                                                                                                                                      VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BASE COUNT
ORIGIN
                                                                                                                                                                                                                                          DEFINITION
                                                                                                                                                                                                                                                                          CNS0091P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                        SOURCE
                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                        ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACCESSION
                                                                                                                                                                                                                                                              COCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
MEDLINE
                   TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
 JOURNAL
                                                                                                                      ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
                                                                                                                                                                                                                                                                                                                                                312
                                                                                                                                                                                                                                                                                                                                                                                 166
                                                                                                                                                                                                                                                                                                                                                                                                                   252
                                                                                                                                                                                                                                                                                                                                                                  gcgttgcaggccgggcgcatcgccgtgccgctttcggtttccacaaggcggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                     ggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggc 165
                                                                                                                                                                                                                                                                                                                                                GTCTACCAGCTCGGCGCGATCGCGATGCCGCTGTCGATGCTGTTCGGCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                   GGCGACCGCGTCGCGATCGTGATGCCGCAGCGGATCGAGACCGTGGTCGCCCCACATGGCG 311
                                              Drosophila melanogaster
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Ins
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
1 (bases 1 to 925)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   69;
                                                                                                                                                                                                                       Drosophila melanogaster genome survey sequence TET3 end of BAC # BACR19D16 of RPCI-98 library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Details of Leishmania sequencing at the Sanger Centre are available at http://www.sanger.ac.uk/Projects/L_major/
The primer sequence can be obtained from alicat@sanger.ac.uk.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Submitted (24-JUL-2000) Leishmania major Friedlin genome sequencing project. Sanger Centre, The Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 18A, E-mail: barrell@sanger.ac.uk and alicat@sanger.ac.uk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Leishmania major Friedlin PAC P929 right end-sequence, similar to TR:087548 087548 ACSA (FRAGMENT). [0] +3..., N=164, Prob=2.5e-14, genomic survey sequence.
Submitted (02-JUN-1999) Genoscope -
                                                                                                                                                        GSS
                                                                                                                                                                                      fly), genomic survey AL053013
                                                                                                                                                                                                                                                            CNS0091P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                see http://www.ebi.ac.uk/parasites/leish.html
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Taylor, R.G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A physical map of the Leishmania major Friedlin Genome Res. 8 (2), 135-145 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ivens,A.C., Lewis,S.M., Bagherzadeh,A.,
Smith,D.F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Leishmania
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P929R
                   Direct Submission
                                  Genoscope.
                                                                                                                                                                      AL053013.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Barrell, B.G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AL390626.1 GI:9501602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98146435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Leishmania major.
                                                                                                                                        fruit fly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Leishmania
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1 to 430)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (bases 1 to 430)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /db_xref="taxon:5664"
/clone="PAC P929"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Leishmania major"
/strain="Friedlin"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Euglenozoa; Kinetoplastida; Trypanosomatidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               major
                                                                                                                                                                        GI:4934461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Huckle, E.E.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           141 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 430 bp
                                                                                                                                                                                                                                                          925 bp
                                                                                                                                                                                                        sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 43.2; DB Pred. No. 0.051;
                                                                                                                                                                                                                                                            DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ivens, A.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           86
Centre National de Sequencage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       193;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Zhang, L., Chan, H.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Rajandream, M.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 430;
                                                                                                                                                                                                                                                            03-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                 217
                                                                                                                                                                                                                                                                                                                                                363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
```

```
RESULT 4
AW982729/c
                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BASE COUNT
ORIGIN
                                                    REFERENCE
                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMENT
                                                                                                                                                              KEYWORDS
                                                                                                                                                                                  VERSION
                                                                                                                                                                                                         ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local 9
                             AUTHORS
                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                                                                                            860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              σ
                                                                                                                                                                                                                                                                                                                                                                                                                                               acatgttgcgcggcggcccggggaatccccgc 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcggcgaac 65
                                                                                                                                                                                                                                                                                                                                                                                                          STSTCCSCCCYMCTCCSTYBMBCYTSTSCGGSSSSSGKGGVTKCGCGGCGSSSTNGMBGT 85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtcgtgca 305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BSCTSTSSSSSSSYSSSTCSCCTCCCSYSYSSSTSSSSSTSWGSTSGSSSSSSYGTSSSSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGSWSAGGGSGSTGSTSSSSSSSSTSTSSSSVSSGSKSSTBSSGSBSSSGSSSSSSTSSB 739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggggcgcat 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gctgaatgtggcacaggagctgagccgttgtggttccacgggtgaccgcgtggtgatctc 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YGKGCSSGSGBSCSCCSSCSSSSCSCCBCCCCCSCSSYCCSSSBSSSKCSSTSBSCSC 619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pleter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; on bw sp, the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library and beautiful of the control library.
                                                                                                                                                                              AW982729 574 bp mRNA EST
HVSMEg0004A20f Hordeum vulgare pre-anthesis
HVCDNA0008 (white to yellow anther) Hordeum
HVSMEg0004A20f, mRNA sequence.
AW982729
AW982729.1 GI:8174309
                         Wing, R., Close, T.J., Kleinhofs, A.,
                                           Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Hordeum. 1 (bases 1 to 574)
                                                                                                                                                              EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                Hordeum vulgare
                                                                                                                                     barley.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          191 91006 EVRY cedex - FRANCE (E-mail : segref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
    Anderson, H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     : www.genoscope.cns.fr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Drosophila m
/ob_xref="taxon:7227"
/clone_lib="RFCI-98"
/clone="BACR19016"
/note="end : TET3"
a 61 c 61 g 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             . 925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4.5%;
    Dale, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 40.6; DE Pred. No. 0.34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
    Henry,D.,
                                                                                                                                                                                                                                                                                                                                                                                                            891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    melanogaster"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          172
Wise,R., Begum,D., Frisch,
., Kernodle,S., Palmer,M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ٠
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          511 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                              25-JUL-2000
spike EST library
vulgare cDNA clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        925;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                         Spermatophyta;
                      Frisch, D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      799
    Rambo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
```

r

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 5
CNS017SY/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMENT
                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                                                                        KEYWORDS
                                                                                                                                                                                                                                                                                                                                             VERSION
                                                                                                                                                                                                                                                                                                                                                               ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                    DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                        Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                       JOURNAL
                                                                                                                                                                            TITLE
                                                                                                                                                                                                                                                                                        ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cggcgaacgctgaatgtggcacaggagcttgagccgttgtggttccacgggtgaccgcgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGCGGTCCTCTTGGGGAGCAGCACGGGGTTGATCTTGGGGATAACGCCGCCGTGCGCGAT 424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGTGACGCCGGCCAGCAGCTTTCCGAGCTCTTCGTCGTTCCTGACGGCGAGCAGCAGCAGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggcc
- Web : www.genoscope.cns.fr)

Determination of this BAC-end sequence was carried out as par collaboration with the European Drosophila Genome Project (EE http://www.edgp.ebi.ac.uk - This Drosophila melanogaster BAC library (Dros BAC) was made by Alain Billaud at CEPH (Centre d'Etude du Polymorphisme Humain) with funding provided by a project grant. The DNA was prepared from embryos by Alain Buc
                                                                                                                                                                                                                          Plasmid Drosophila melanogaster
Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Ins
Pterygota; Neoptera; Endopterygota; Diptera; Brachycera;
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                               Drosophila melanogaster genome survey sequence BACN37L08 of DrosBAC library from Drosophila me
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Email: rwing@clemson.edu
Email: rwing@clemson.edu
Seq primer: AATTAACCCTCACTAAAGGG
Seq primer: AATTAACCCTCACTAAAGGG
Seq primer: AATTAACCCTCACTAAAGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wood, T.
                                                                                                                                  Submitted (23-JUL-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : segref@genoscope.cns.fi
                                                                                                                                                                                                                                                                                                                                                                                                                                        CNS017SY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Development of a genetically and physically anchored for barley genomics unpublished (2000)
                                                                                                                                                                          Direct Submission
                                                                                                                                                                                                                                                                                                                                             AL108460.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Tel: 864 656 7288 Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Contact: Wing RA
                                                                                                                                                                                                                                                                                                         fruit fly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   100 Jordan Hall,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                             (bases 1 to 1101)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   quality sequence start: 18 quality sequence stop: 556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Saski, C., Schwartzbeck, J., Simmons, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                              genomic survey sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /tissue_type="pre-anthesis spike"
/lab_host="SOLR"
/note="Vector: lambdaZAP; Site_1:
201 c 162 g 82 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /clone_lib="Hordeum vulgare pre-anthesis HVcDNA0008 (white to yellow anther)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="taxon:4513"
/clone="HVSMEg0004A20f"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /cultivar="Morex"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Hordeum vulgare"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1. .574
                                                                                                                                                                                                                                                                                                                                             GI:5628764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.2%;
51.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                        1101 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 37.6;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                        DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SC 29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           97;
                                                                                                                                    segref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EcoR1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Choi, D.W., Main, D. and
                                                                                                                                                                                                                                                                                                                                                                                               ce SP6 end of melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           574;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Site_2: Xhol'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        spike EST library
                                                                                                                                                                                                                                                                                                                                                                                                                                        26-JUL-1999
     ded by a MRC
Alain Bucheton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TSB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                    BAC
                                                                                               part of
                                                                                                                                                                                                                                                                                                                                                                                                 (fruit
                                                             BAC
                                                                              (EDGP) -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
```

ľ

```
JOURNAL
MEDLINE
COMMENT
                                                                                                                                                                                                                                                                                                       KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
F14761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                     FEATURES
                                                                                                                                                                                                                                                             REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                   BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                        FOCUS
                                                                                                                                                                                                                                                                                                                                                CESSION
ARSION
                                                                                                                                                                                                                                 TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          335
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TBBSSBSSSSSTSSSBBTSKSBTSBSSBSTSSSASBSSSSSSSSSTSTTBSTSBBBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccctgacgcggtcgcagctgtatcggcgaacgctgaatgtggcacaggagctgagccgtt 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CSCSGT 743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SCGSTSGSSCSSBCGKSTSSGSTSSGTTCGBCSSTGGCSCCCYCSCCCTCSTCGTSTCCS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctacatcgtctgccgtggacgacgtcgtgcaacatgttgcgcggcggcccggggaatccc 334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gcgttaccgatgaacgttccgattcggtactgagtgattcgtcgccggtggccattctca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cctatctcggcgcgttgcaggccgggcgcatcgccgtgccgctttcggttccacaaggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtggttccacgggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgccat 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SBSTTTSBSSTBSSYGSSSBTCTSKCSTBTSGSTBTSTBMSKBSSTSSTSBTSGSSBCGG
                                                                                                               Contact: A.K. Winteroe
Department of Animal Science and Animal Health, Division of Animal
Genetics, The Royal Veterinary and Agricultural University
Bulowsvej 13, 1870 Frederiksberg C, Denmark.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                c9c08, mRNA sequence.
F14761
F14761.1 GI:972340
                                                                                                                                                                                                   Evaluation and characterization of a library: analysis of 839 clones Mamm. Genome 7 (7), 509-517 (1996)
                                                                                                                                                                                                                                                                                                                                                                                       F14761 249 bp
SSC9C08 Porcine small
                                                                                                                                                                                                                                                          Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; 1 (bases 1 to 249)
                                                                                                                                                                                         96327607
                                                                                                                                                                                                                                                Wintero, A.K., Fredholm, M. and Davies, W.
                                                                                                                                                                                                                                                                                                     Sus scrofa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             pBeloBAC11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Genevieve Payan. It has
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative 143;
                   37
/db_xref="taxon:7227"
/clone_lib="DrosBAC"
                                                                       /organism="Sus scrofa"
/db_xref="taxon:9823"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /clone="BACN37L08"
/note="end : SP6"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Drosophila melanogaster"
/plasmid="pBeloBAC11"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4.2%; Score 37.6;
13.4%; Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                          intestine cDNA library Sus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             160 g
                                                                                                                                                                                                                                                                                                                                                                                                        mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          been
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          constructed in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          122;
                                                                                                                                                                                                                               porcine small intestine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      190;
                                                                                                                                                                                                                                                                                                                                                                                                        EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 1101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the vector
                                                                                                                                                                                                                                                                                                                                                                                          scrofa cDNA clone
                                                                                                                                                                                                                                                                                                                                                                                                        09-SEP-1996
                                                                                                                                                                                                                                                                         Euteleostomi;
Sus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             214
                                                                                                                                                                                                                                 CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
```

```
RESULT 7
BE417569/c
                                    QΥ
                                                                              밁
                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
  Db
                                                                                                                                                                                                                                                    ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                        BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 57
                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
  161
                                        103
                                                                              221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    217 CGNGCCCTGCAGTCGGGNCAATGCGCTGGAGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
hes 57; Conserv
                                                                                                                  43
                                                                                                  cggtcgcagctgtatcggcgaacgctgaatgtggcacaggagctgagccgttgtggttcc 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggcgcgttgcaggccgggcgcatcgccgtgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  acgggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctc 162
GCCGCCGTGCGCGATGGTGACGCCGGCCAGCAGCTTGCCGAGCTCCTCGTCGTTCCGGAC 102
                                    acgggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctc 162
                                                                      CTGGCCCTCCTTCTCCGCCGTCTTCTTGGGGAGCAGCACGGGGTTGATCTTGGGGATGAC 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAGGGGGTGCGCGTGAACTGTGCTCGCGGAGGGATCGTGGACGAAGGCGCCCCTGCTC 216
                                                                                                                                                        93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Anderson,O.A., Appels,R., Bailey,P., Blake,T., Close,T., Cloutier,S., Dubcovsky,J., Feuillet,C., Gale,M., Graner,A., Gustafson,P., Herrmann,R.G., Holton,T., Jacquemin,J.M., Jia,J., Joudrier,P., Langridge,P., Lazo,G.R., Lin,J.J., McGuire,P., Ogihara,Y., Pecchioni,N., Qualset,C., Schuch,W., Selvaraj,G., Shariflou,M., Sorrells,M., Warburton,M. and Wenzel,G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      http://wheat.pw.usda.gov/genome
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Kihara Institute for Biological Research, Yokohama City
Maioka-cho 641-12, Totsuka-ku, Yokohama 244-0813, JAPAN
Tel: 81 45 820 1903
Fax: 81 45 820 1901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Triticum.

1 (bases 1 to 477)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BE417569 477 bp mRNA EST 24-JUL-2000 MUG022_D04R990620 ITEC MUG Wheat Spikelet Library Triticum aestivum cDNA clone MUG022_D04, mRNA sequence.

BE417569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Email: ogihara@yokohama-cu.ac.jp
International Triticeae EST Cooperative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Contact: Ogihara Y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Expressed Sequence Tags for Species of the Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                International Triticeae EST Cooperative (ITEC): Production of Expressed Sequence Tags for Species of the Triticeae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BE417569.1
EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  bread wheat
                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                        103
                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                    /tissue_type="young spikelets"
/dev_stage="Feekes' scale 6-7"
/note="Vector: pBluescript SK(-); Site_1:
XhoI; M13 Reverse sequencing primer used.
                                                                                                                                                                                                                                                                                        insert size.
                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Triticum aestivum"
/cultivar="Norin 26"
                                                                                                                                                                                                                                                                                                                                                                                    clone_lib="ITEC MUG Wheat Spikelet Library"
                                                                                                                                                                                                                                                                                                                                                                                                          /clone="MUG022.D04"
                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="taxon:4565"
                                                                                                                                                                        4.18;
49.78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4.1%;
61.3%;
                                                                                                                                                                                                                                                                        140
                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                        0;
                                                                                                                                                                    Score 36.6; DB 108;
Pred. No. 4.4;
                                                                                                                                                                                                                                                                  134 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 36.6; D
Pred. No. 3.9;
                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                      100 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 140;
                                                                                                                                                        94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         36;
                                                                                                                                                        Indels
                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                              477;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               249;
                                                                                                                                                                                                                                                                                                                              EcoRI; Site,
                                                                                                                                                                                                                                                                                                        1.2 Kbp average
                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0,
```

0;

Q

밁

Ş

В

```
RESULT 8
BE415878/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ACCESSION
                                                                                                                                                                                                                                                                               Best Loc
Matches
                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                      161
                                                                                                                                                           103
                                                                                                                                                                                                 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        163
    223
                                                                               163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            223
                                          101
                                                                                                                                                                                                                                      43
                                                                                                                                                                                                                                                                                                 Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        41
                                                                                                                                        acgggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgtcgctatctc 162
gatgaac 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gatgaac 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggcgcgttgcaggccgggcatcgccgtgccgctttcggttccacaaggcggcgttacc
                                          GGCGAGCAGCAGGTGGCGCGGATGATGCCGGCTCTTCTTGTTGTCCTTGGCGGCGTTGCC
                                                                         ggcgcgttgcaggccgggcatcgccgtgccgctttcggttccacaaggcggcgttacc
                                                                                                                      GCCGCCGTGCGCGATGGTGACGCCGGCCAGCAGCTTGCCGAGCTCCTCGTTCCGGAC
                                                                                                                                                                                                 CTGGCCCTCCTTCTCCGCCGTCTTCTTGGGGAGCAGCACGGGGTTGATCTTGGGGATGAC 162
                                                                                                                                                                                                                                    cggtcgcagctgtatcggcgaacgctgaatgtggcacaggagctgagccgttgtggttcc 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGCGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGCGAGCAGCAGGTGGCGGGATGATGCGGCTCTTCTTGTTGTCCTTGGCGGCGTTGCC
                                                                                                                                                                                                                                                                             93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Contact: Ogihara Y
Kihara Institute for Biological Research, Yokohama City University
Maioka-cho 641-12, Totsuka-ku, Yokohama 244-0813, JAPAN
Tel: 81 45 820 1903
Fax: 81 45 820 1901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Anderson,O.A., Appéls,R., Bailey,P., Blake,T., Close,T., Cloutier,S., Dubcovsky,J., Feuillet,C., Gale,M., Graner,A., Gustafson,P., Hermann,R.G., Holton,T., Jacquemin,J.M., Jia,J., Joudrier,P., Langridge,P., Lazo,G.R., Lin,J.J., McGuire,P., Ogihara,Y., Pecchioni,N., Qualset,C., Schuch,W., Selvaraj,G., Shariflou,M., Sorrells,M., Warburton,M. and Wenzel,G.
International Triticeae EST Cooperative (ITEC): Production of Expressed Sequence Tags for Species of the Triticeae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BE415878 478 bp
MUG002.A03R990520 ITEC
CDNA clone MUG002.A03,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Email: ogihara@yokohama-cu.ac.jp
International Triticeae EST Cooperative (ITEC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Expressed Sequence Tags for Species of the Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Triticum.

1 (bases 1 to 478)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        http://wheat.pw.usda.gov/genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BE415878.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE415878
                                                                                                                                                                                                                                                                             Similarity 49.
93; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          bread wheat
                                                                                                                                                                                                                                                                                                                                                                                                 104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          35
                                                                                                                                                                                                                                                                                                                                                                                                                              /tissue_type="young spikelets"
/tissue_type="young spikelets"
/dev_stage="Feekes' scale 6-7"
/note="Vector: pBluescript SK(-); Site_1: EcoRI; Site_2:
/note="Vector: pBluescript SK(-); Site_1: EcoRI; Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                 insert size.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="taxon:4565"
/clone="MUG002.A03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Triticum aestivum"
/cultivar="Norin 26"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /clone_lib="ITEC MUG Wheat Spikelet Library"
                                                                                                                                                                                                                                                                                               4.18;
                                                                                                                                                                                                                                                                                                                                                                                               140 c
                                                                                                                                                                                                                                                                             0,
                                                                                                                                                                                                                                                                             Score 36.6; DI
Pred. No. 4.4;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                             134 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MUG Wheat Spikelet Library mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                 100
                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                                    107;
                                                                                                                                                                                                                                                                             94;
                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                 Length 478;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24-JUL-2000
                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     42
                                                                                                                      102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          222
                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                  δÃ
                                                                                                                                                             맑
                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                    DЪ
                                                                                                                                                                                                                                                                                                                                                    ρy
```

Ş

οy 밁 δ Вþ ρy

밁

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
RESULT 10
AW926475/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE416420/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Sir
Matches 93;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                        109
                                                                                                                                                                                                                                  169
                                                                                                                                                                                                                                                                      103
                                                                                                                                                                                                                                                                                                              229
                                                                                                                  223
                                                                                                                                                                                            163
                                                                              49
                                                                                                                                                                                                                                                                                                                                                  43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 41
                                                                                                                                                                                                                                                      acgggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctc 162
                                                                            GGCGAGC 43
                                                                                                                                                                              ggcgcgttgcaggccgggcatcgccgtgccgctttcggttccacaaggcggcgttacc
                                                                                                                                                                                                                                                                                                            CTGGCCCTCCTTCTCCGCCGTCTTCTTGGGGAGCAGCACGGGGTTGATCTTGGGGATGAC 170
                                                                                                                                                                                                                                                                                                                                          cggtcgcagctgtatcggcgaacgctgaatgtggcacaggagctgagccgttgtggttcc 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCGAGC
                                                                                                                gatgaac
                                                                                                                                                      GGCGAGCAGCAGGTGGCGGGATGATGCGGCTCTTCTTGTTGTCCTTGGCGGCGTTGCC
                                                                                                                                                                                                                                    GCCGCCGTGCGCGATGGTGACGCCGGCCAGCAGCTTGCCGAGCTCCTCGTCGTTCCGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Contact: Ogihara Y
Kihara Institute for Biological Research, Yokohama
Maioka-cho 641-12, Totsuka-ku, Yokohama 244-0813,
Tel: 81 45 820 1903
Fax: 81 45 820 1901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Anderson,O.A., Appels,R., Bailey,P., Blake,T., Close,T., Clouti,S., Dubcovsky,J., Feuillet,C., Gale,M., Graner,A., Gustafson,P. Herrmann,R.G., Holton,T., Jacquemin,J.M., Jia,J., Joudrier,P., Langridge,P., Lazo,G.R., Lin,J.J., McGuire,P., Ogihara,Y., Pecchioni,N., Qualset,C., Schuch,W., Selvaraj,G., Shariflou,M., Sorrells,M., Warburton,M. and Wenzel,G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BE416420 484
MUG008.E04R990628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Email: ogihara@yokohama-cu.ac.jp
International Triticeae EST Cooperative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                International Triticeae EST Cooperative (ITEC): Production 
Expressed Sequence Tags for Species of the Triticeae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Triticum.

1 (bases 1 to 484)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BE416420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cDNA clone MUG008.E04,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        http://wheat.pw.usda.gov/genome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  bread wheat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BE416420.1
                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        105
                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <u>3</u>5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  XhoI; M13 Reverse sequencing primer used.
insert size."
138 c 137 q 102 +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /tissue_type="young spikelets"
/dev_stage="Feekes' scale 6-7"
/note="Vector: pBluescript SK(');
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Triticum aestivum"
/cultivar="Norin 26"
/db_xref="taxon:4565"
/clone="MUG008.E04"
/clone=lib="TEC MUG Wheat Spikelet Library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1. .484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                        4.18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bp
ITEC
                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                    Score 36.6; DB Pred. No. 4.4; 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mRNA EST 24-JUL-2000 MUG Wheat Spikelet Library Triticum aes ivum
                                                                                                                                                                                                                                                                                                                                                                                        94;
                                                                                                                                                                                                                                                                                                                                                                                                                              108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (ITEC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Yokohama City
44-0813, JAPAN
                                                                                                                                                                                                                                                                                                                                                                                                                            Length 484;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ECORI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gustafson, P.,
                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kbp average
                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cloutier
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Site_2:
                                                                                                                                                                                                                                    110
                                                                                                                                                                                              222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of
                                                                                                                                                          50
                                                                                                                                                                                                                                                                                                                                                                                        0;
```

```
RESULT 1
AU090557
LOCUS
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LOCUS
DEFINITION
                                                         SOURCE
ORGANISM
                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
AUTHORS
                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BASE COUNT
ORIGIN
                                                                                                                                                     DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                         KEYWORDS
                                                                                                         VERSION
                                                                                                                        ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /ERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                                                                                                                                                                                                                               322
                                                                                                                                                                                                                                                                            211
                                                                                                                                                                                                                                                                                                          382
                                                                                                                                                                                                                                                                                                                                       151
                                                                                                                                                                                                                                                                                                                                                                      442
                                                                                                                                                                                                                                                                                                                                                                                                  91
                                                                                                                                                                                                  11
                                                                                                                                                                                                                                               GGCGGCGTTCCCGGCGAGC 304
                                                                                                                                                                                                                                                                        ggcggcgttaccgatgaac
                                                                                                                                                                                                                                                                                                         GTCATTCCTGACGGCGAGCAGCAGGTGGCGCGCGGGATGATGCGGCCTCTTCTTGTTCTTT
                                                                                                                                                                                                                                                                                                                            gtcgcctatctcggcgcgttgcaggccgggcgcatcgccgtgccgctttcggttccacaa
                                                                                                                                                                                                                                                                                                                                                                    CTTGGGGATCACCCCGCCGTGCGCGATGGTGACGCCCCCAGCAGCTTGCCGAGCTCCTC
                                                                                                                                                                                                                                                                                                                                                                                               cgttgtggttccacgggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtc 150
                                                                                                                                                                                                                                                                                                                                                                                                                                 l Similarity
75; Conserv
                                                         Oryza sativa.
Oryza sativa
                                                                                                                                  AU090557 673 bp mRNA
AU090557 Rice panicle at flowering
E4063, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clemson University Genomics Institute
Clemson University
100 Jordan Hall, Clemson, SC 29634, U.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Wing,R., Close,T.J., Kleinhofs,A., Wise,R., Begum,D., Frisch,D., Y., Anderson,H., Dale,J., Henry,D., Kernodle,S., Palmer,M., Rambo,T., Saski,C., Schwartzbeck,J., Simmons,J., Choi,D.W., Main,D. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AW926475 849 bp mRNA EST 25-JUL-2000 HVSMEG0007F03 Hordeum vulgare pre-anthesis spike EST library HVCMDNA0008 (white to yellow anther) Hordeum vulgare cDNA clone HVSMEG0007F03, mRNA sequence.
         Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Oryza.

1 (bases 1 to 673)
                                                                                                                      AU090557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for barley genomics
Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Hordeum.

1 (bases 1 to 849)
                                                                                         AU090557.1
EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Email: rwing@clemson.edu
High quality sequence stop: |
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Tel: 864 656 7288 Fax: 864 656 4293
Sasaki,T. and Yamamoto,K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Development of a genetically and physically anchored EST resource
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hordeum vulgare
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             barley.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AW926475.1 GI:8098217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             172
                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /clone="HVSMEg0007F03"
/clone_lib="Hordeum vulgare pre-anthesis spike EST library
HVcDNA0008 (white to yellow anther)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Hordeum vulgare"
/cultivar="Morex"
/db_xref="taxon:4513"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Vector: lambdaZAP; Site_1: EcoR1; Site_2: Xho1"
231 c 340 g 106 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /tissue_type="pre-anthesis spike"
/lab_host="SOLR"
                                                                                                        GI:7645993
                                                                                                                                                                                                                                                                                                                                                                                                                                              4.1%;
                                                                                                                                                                                                                                                                            229
                                                                                                                                                                                                                                                                                                                                                                                                                            pred. No. 4.9;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         340 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                               DΒ
                                                                                                                                                   stage
                                                                                                                                                                                                                                                                                                                                                                                                                                 64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              97;
                                                                                                                                                   Oryza
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                   sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                               849;
                                                                                                                                                                   25-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                   CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                     210
                                                                                                                                                   clone
                                                                                                                                                                                                                                                                                                                                                                  383
                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
COMMENT
                                                                                                                                                                                                                                                                                        KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 1
BE416649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                         COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                             REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                  DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BASE COUNT
                                                                                                                                                                                                                                                                                                                                     VERSION
                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                  CUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
                                                                                                        JOURNAL
                                                                                                                                     TITLE
                                                                                                                                                                                                                             AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           880 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C
```

```
760 acaaccgacgacgtgacgggggtgacctcggcaacatactgaccatcctcagcggt 819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  agcgagcgggtacaggccgcgacgatcaagcgcttcgccgaccgctttgctcgcttcaat 879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       416 bp
4 MUG009.H03R990527 ITEC M
CDNA clone MUG009.H03, mt
BE416649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCGGCGGGCTCCAGTGCGCCGGCGGCAACGGCGGCGCCGACCGGGTCGCGTTCTACAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ACTCCCGCGGACAGCGCGGCCGGCCGCGCGCCAGGCTACGGGCTCACCACGAACATCCTC 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            880
                                                                                                                                                                Anderson, O.A., Appels, R., Bailey, P., Blake, T., Close, T., Cloutier, S., Dubcovsky, J., Feuillet, C., Gale, M., Graner, A., Gustafson, P., Herrmann, R.G., Holton, T., Jacquemin, J.M., Jia, J., Joudrier, P., Langridge, P., Lazo, G.R., Lin, J.J., McGuire, P., Ogilhara, Y., Pecchioni, N., Qualset, C., Schuch, W., Selvaraj, G., Shariflou, M., Sorrells, M., Warburton, M. and Wenzel, G. International Triticeae EST Cooperative (ITEC): Production of Expressed Sequence Tags for Species of the Triticeae Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                349
                                               Kihara Institute for Biological Research, Yokohama City University
Maioka-cho 641-12, Totsuka-ku, Yokohama 244-0813, JAPAN
Tel: 81 45 820 1901
Fax: 81 45 820 1901
                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Triticum.

1 (bases 1 to 416)
                                                                                                                                                                                                                                                                                                                                                                                                                                                 bread wheat.
Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Tel: 0298-38-7441
Fax: 0298-38-7468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (2000)
Contact: Takuji Sasaki
National Institute of Agrobiological Resources
Rice Genome Research Program
Email: ogihara@yokohama-cu.ac.jp
International Triticeae EST Cooperative (ITEC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Email: tsasaki@abr.affrc.go.jp
PROJECT ='RGP'.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Japan 305
                                                                                                                                             Contact: Ogihara Y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BE416649.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          E4063_4Z.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ibaraki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rice cDNA from panicle at flowering
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2-1-2 Kannondai,Tsukuba
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Organ: panicle; Rice cDNA from panicle at flowering stage"
a 205 c 215 g 116 t 3 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="taxon:4530"
/clone="E4063"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /clone_lib="Rice panicle at flowering stage"
/dev_stage="flowering stage"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /strain="Nipponbare"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ∕organism="Oryza sativa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GI:9414397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 36.2; D
Pred. No. 6.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        215 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MUG W
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              mRNA EST 24-JUL-2000
IUG Wheat Spikelet Library Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               stage (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 673;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0,
```

```
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 13
AQ846629/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RCE
                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               atches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                146 acgtcgtcgcctatctcggcgcgttgcaggccgggcatcgccgtgccgctttcggttc 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      161 TTGGGAGACTTGGGCTCCTTGCCCTTCTTCGGGGAGCAGCAGCACCGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           206 cacaaggcggcgttaccgatgaac 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                221 TTGATCTTGGGGATCACACCGCCGTGCGCGATGGTGACGCCGGCCAACAGCTTTCCGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             26 ttgcgataaccctgacgcggtcgcagctgtatcggcgaacgctgaatgtggcacaggagc 85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity 48.1
les 99; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TCCTTGGCGGCGTTCCCGGCGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TCCTCGTCGTTCCGGACGGCGAGCAGCAGGTGCCGCGGGATGATGCGGCTCTTCCTGTTG 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgagccgttgtggttccacgggtgaccgcgtggtgatctctgctccgcagggactcgagt 145
                                                                                                                                                                                                                                                                                   Akopyants, N.S., Clifton, S., Marra, M., Hillier, L., Chinwalla, A., Akopyants, N.S., Clifton, S., Marra, M., Hillier, L., Chinwalla, A., Pape, D., Martin, J., Wylie, T., Li, L., Kissinger, J., Blistain, A., Schmitt, A., Person, B., Theising, B., Ritter, E., Ronko, I., Bennett, J., Cole, R., Underwood, K., Cardenas, M., Gibbons, M., Harvey, N., McCann, R., Tsagareishvili, R., Williams, T., Jackson, Y., Bowers, Y., Swaller, T., Waterston, R., Wilson, R., Roos, D.S. and Beverley, S.M., A survey of the Leishmania major Friedlin strain VI genome by
                                                                                                                                                                                               shotgun sequencing: a resource for
Unpublished (1999)
Contact: Akopyants, NS / Beverley,
WashU Leishmania Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AQ846629 439 bp DNA GSS 05-JUL-2000 LMAJFV1_lm27c03.x1 Leishmania major FV1 random genomic library Leishmania major genomic clone LMAJFV1_lm27c03 3′ similar to contains element V1-ch1_type_II.3 leishmania repetitive element ;,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          css
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA sequence.
AQ846629
AQ846629.1 GI:6051277
                                                                                                                                                    Washington University School of Medicine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Leishmania major
                                                               Library construction: Natalia S. Akopyants, Ph.D
                                                                                        Email: est@watson.wustl.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Leishmania
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eukaryota; Euglenozoa; Kinetoplastida; Trypanosomatidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Leishmania
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              http://wheat.pw.usda.gov/genome
  DNA Sequencing by: Washington University Genome Sequencing If using this information please cite: N.S. Akopyants and S.M. Beverley 'A survey of the Leishmani
                                                                                                             314 286 1800
314 286 1810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               XhoI; M13 Reverse sequencing primer used.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /db_xref="taxon:4565"
/clone="MUG009.H03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      insert size
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Vector: pBluescript SK(-); Site_1: EcoRI; Site_2:
XhoI; M13 Reverse sequencing primer used. 1.2 Kbp avera
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /tissue_type="young spikelets"
/dev_stage="Feekes' scale 6-7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /clone_lib="ITEC MUG Wheat Spikelet Library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /cultivar="Norin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Triticum aestivum"
/cultivar="Norin 26"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Locati
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 major.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               48.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ion/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 36; DB:
Pred. No. 6.4;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          128 g
                                                                                                                                                                                                                                                                   for DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 92
t
'A survey of the Leishmania major
                                                                                                                                                                                                                        MS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               105;
                                                                                                                                                        Louis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 416;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                        <u>₹</u>
                                                                                                                                                        63108, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Kbp average
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      220
                                             Center
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                         COMMENT
                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
```

ř

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 14
AQ851993/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
VERSION
                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                    JOURNAL
                                                                                                   TITLE
                                                                                                                                                                                                                                                     AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aacgttccgattcggtactgagtgattcgtcgccggtggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CTCACCTCTCGCCGCACCCCTGTAGCCGCACTCCGCCTGAGCCGCTGCTCTCTCGCTC 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgcagctgtatcggcgaacgctgaatgtggcacaggagctgagccgttgtggttccacgg 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGGAGGGAAAGGGGGACCTCGTGATGACGAGGCTCTTGCCGAAAGTCGGAGCTACACGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GATGGTCACAACTGGTTGTGAGCGGCTGCCCGGCGGTGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgttgcaggccgggcgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               105;
                                                                                        Akopyants, N.S., Clifton, S., Marra, M., Hillier, L., Chinwalla, A., Akopyants, N.S., Clifton, S., Marra, M., Kissinger, J., Blistain, A., Pape, D., Martin, J., Wylie, T., Li, L., Kissinger, J., Blistain, A., Schmitt, A., Person, B., Theising, B., Ritter, E., Ronko, I., Bennett, J., Cole, R., Underwood, K., Cardenas, M., Gibbons, M., Harvey, N., McCann, R., Tsagareishvili, R., Williams, T., Jackson, Y., Bowers, Y., Swaller, T., Waterston, R., Williams, T., Jackson, Y., Bowers, Y., Swaller, T., Waterston, R., Williams, T., Jackson, Y., Bowers, Y., Swaller, T., Waterston, R., Wilson, R., Roos, D.S. and Beverley, S.M. A survey of the Leishmania major Friedlin strain V1 genome by
                                                                                                                                                                                                                                                                                                              Leishmania major.
Leishmania major
Eukaryota; Euglenozoa; Kinetoplastida; Trypanosomatidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AQ851993 465 bp DNA GSS 05-JU LMAJFV1_lm59g03.y1 Leishmania major FV1 random genomic Leishmania major genomic clone LMAJFV1_lm59g03 5' simil contains element V1-ch1_type_II.3 leishmania repetitiv
                                            Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Friedlin strain VI genome by shotgun sequencing' and the Washing University Genome Sequencing Center For information on obtaining clone material please contact: Natalia S. Akopyants Ph.D. (natalia@borcim.wustl.edu) and/or Stephen M. Beverley Ph.D.
                          Other_GSSs: lm59g03.x1
                                                                   shotgun sequencing: a resource
                                                                                                                                                                                                                                                                                                                                                                                                                                                      AQ851993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Seq primer: -40UP from Gibco
                                                                                                                                                                                                                                                                                                      Leishmania.
                                                                                                                                                                                                                                                                                                                                                                                                                                 AQ851993.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (beverley@borcim.wustl.edu)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              quality sequence stop: 430.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ø
Akopyants, NS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            this library, DNA was sheared to give a tight size distribution of 1-1.5kb fragments, blunt-ended with T4 DNA polymerase, dephosphorylated with Shrimp Alkaline Phosphatase and ligated into pZero-2 vector's ECORV site." a 154 c 123 g 68 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /clone_lib="Leishmania major FVI random genomic library"
/lab_host="ToP10 (Invitrogen)" Site_1: EcoRV;
/note="Vector: pzero-2 (Invitrogen); Site_1: EcoRV;
Genomic DNA was isolated from stationary phase cells. Fo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /strain="Friedlin strain
/db_xref="taxon:5664"
/clone="LMAJFV1_lm27c03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Leishmania major"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                              GI:6091295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4.08;
47.78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. 6.5;
); Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 36;
Pred. No.
Beverley,
                                                                           for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6.5;
                                                                           DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               115;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 439;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       repetitive element ;,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             and the Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     05-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   library
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cells. For
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0,
```

٨,

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                     RESULT 15
BE605099/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                                                                                                            ACCESSION
                                                                                                                                                                                                                                                                                                          DEFINITION
                                                                                                                                                                                                         KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local (
                                                                                                                                                           ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         47
                                                                                                                                                                                                                                                                                                                                                                                                                                                         97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aacgttccgattcggtactgagtgattcgtcgccggtggc 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                         GATGGTCACAACTGGTTGTGAGCGGCTGCCCGGCGGTGTC 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgttgcaggccgggcgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CTCACCTCTCGCCGCACCCCTGTAGCCGCACTCCGCCTGAGCCGCTGCTCTCTCGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgcagctgtatcggcgaacgctgaatgtggcacaggagctgagccgttgtggttccacgg 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGGAGGGAAAGGGGGACCTCGTGATGACGAGGCTCTTGCCGAAAGTCGGAGCTACACGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Triticum aestivum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; Liliopsida; Poales; Poaceae; Triticum.
1 (bases 1 to 467)
Anderson,O.D., Chao,S., Choi,D.W., Close,T.J., Fenton,R.D., Han,P.S., Hsia,C.C., Kang,Y., Lazo,G.R., Malatrasi,M., Miller,R., Nguyen,H.T., Rausch,C.J., Seaton,C.L., Tong,J.C. and Zhang,D.
                                                                                                                                                                                                                                                       BE605099 467 bp
WHE1701-1704_A09_A09ZS
Triticum aestivum cDNA
BE605099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               If using this information please cite:

N.S. Akopyants and S.M. Beverley 'A survey of the Leishmania major Friedlin strain V1 genome by shotgun sequencing' and the Washington University Genome Sequencing Center For information on obtaining clone material please contact: Natalia S. Akopyants Ph.D. (natalia@borcim.wustl.edu) and/or Stephen M. Beverley Ph.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               High quality sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                BE605099.1 GI:9862369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tel: 314 286 1800 Fax: 314 286 1810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Washington University School of Medicine 4444 Forest Park Parkway, Box 8501, St. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Seg primer: -40RP from Gibco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Library construction: Natalia S. Akopyants, Ph.D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Email: est@watson.wustl.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WashU Leishmania Project
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (beverley@borcim.wustl.edu)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA Sequencing by: Washington University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     shotgun
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /clone_lib="Leishmania major FV1 random genomic library"
/lab host="ToP10 (Invitrogen)"
/note="Vector: pZero-2 (Invitrogen); Site_1: EcoRV;
Genomic DNA was isolated from stationary phase cells. For
this library, DNA was sheared to give a tight size
distribution of 1-1.5kb fragments, blunt-ended with T4 DNA
polymerase, dephosphorylated with Shrimp Alkaline
Phosphatase and ligated into pZero-2 vector's EcoRV site."
a 163 c 129 g 74 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Leishmania major"
/strain="Friedlin strain V1"
/db_xref="riaxon:5664"
/clone="LMAJFV1_lm59g03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4.0%;
47.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 36; DB 171;
Pred. No. 6.6;
                                                                                                                                                                                                                                                                              mRNA
Wheat
clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           389
                                                                                                                                                                                                                                                                           heat stressed spike cDNA library WHE1701-1704_A09_A09, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   St. Louis, MO 63108, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       115;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Genome Sequencing Center
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 465;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
```

δõ В

망

Вþ

οy В

Qy

DЪ

Search completed: January 12, Job time: 21233 sec

2001,

18:01:37

Qy

δÃ

cus

SOURCE VERSION Вр δÃ 밁 Ş

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMENT
                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         source
175
                                                                                                                                        146
                                                                                                                                                                                      295
                                                                                                                                                                                                                                                                                   355
                                           206
                                                                                                                                                                                                                                  86
                                                                                                                                                                                                                                                                                                                            26
TCCTTGGCGGCGTTCCCGGCGAGC
                                         cacaaggcggcgttaccgatgaac
                                                                                                                                     acgtcgtcgcctatctcggcgcgttgcaggccgggcgcatcgccgtgccgctttcggttc 205
                                                                                                                                                                                                               tgagccgttgtggttccacgggtgaccgcgtggtgatctctgctccgcagggactcgagt 145
                                                                                                                                                                                                                                                                         TTGGGAGACTTGGGCTCCTTGCCCTCCTTCTCCGCGGTCCTCTTGGGGAGGAGCACCGGG 296
                                                                                                                                                                                                                                                                                                                          ttgcgataaccctgacgcggtcgcagctgtatcggcgaacgctgaatgtggcacaggagc 85
                                                                                          TCCTCGTCGTTCCTGACGGCGAGCAGCAGCAGGTGGCGCGGGATGATGCGGCTCTTCTTGTTG
                                                                                                                                                                                    TTGATCTTCGGGATCACGCCACCGTGCGCGATGGTGACGCCGGCCAGCAGCTTTCCGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The structure and function of the expressed portion of the wheat genomes - Heat stressed spike cDNA library Unpublished (2000)

Contact: Olin Anderson
US Department of Agriculture, Agriculture Research Service, Pacif West Area, Western Regional Research Center
West Area, Western Regional Research Conter
B00 Buchanan Street, Albany, CA 94710, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence have been
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Email: oandersn@pw.usda.gov
                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     primer:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5105595818
                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="vector: Lambda Uni-ZAP XR, excised phagemid;
/note="vector: Lambda Uni-ZAP XR, excised phagemid;
Site_1: ECORI; Site_2: XhOI; Spikes at 5, 10, 15 and 20
days after anthesis were heat stressed under two
conditions at Texas Tech University (D. Zhang in HT Nguyrn
lab): (1) at 38 C for 4 hours and (2) 5 days of cyclic
treatment of 38 C for 4 hours. Total RNA and poly(A) RNA
were prepared, a cDNA library was made, and the cDNA
clones were in vivo excised to give pBluescript phagemids
in the TJ Close lab (Choi, Close, Fenton, Malatrasi) at
the University of California, Riverside. Plasmid DNA
preparations and DNA sequencing were performed in the OD
Anderson lab (all other authors)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sequence with phred
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             anthesis "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /tissue_type="Whole spike"
/dev_stage="Spikes at 5, 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Triticum aestivum"
/cultivar="Chinese Spring"
/db_xref="taxon:4565"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /lab_host="E. coli SOLR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /clone_lib="Wheat heat stressed spike cDNA library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /clone="WHE1701-1704_A09_A09"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Stratagene
                                                                                                                                                                                                                                                                                                                                                                                                   4.0%;
48.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             trimmed to remove vector the phred score less than
                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                   Score 36;
Pred. No.
152
                                           229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SK primer
                                                                                                                                                                                                                                                                                                                                                                             Mismatches 105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           score less
                                                                                                                                                                                                                                                                                                                                                                                                   6.6;
                                                                                                                                                                                                                                                                                                                                                                                                                         DB 110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15 and
                                                                                                                                                                                                                                                                                                                                                                                                                         Length 467;
                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sequence
20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20 days after
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and low
                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                            176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pacific
                                                                                                                                                                                                                                                                                                                                                                           0;
```

-			

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tal number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              on:
   Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score
 355.4
355.4
357.4
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
357.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        length:
length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Issued_Patents_NA:*

1: /cgn2_6/ptodata/1,

2: /cgn2_6/ptodata/1,

3: /cgn2_6/ptodata/1,

4: /cgn2_6/ptodata/1,

5: /cgn2_6/ptodata/1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query
Match Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDENTITY_NUC Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-461-774-5
903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     280836 seqs, 80580151 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           January 12, 2001, 20:12:43;
   GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gattacgaacaggactggga....aggagagggtgaaagcttaa
   /cgn2_6/ptodata/1/ina/5A_COMB.seq:*
/cgn2_6/ptodata/1/ina/5B_COMB.seq:*
/cgn2_6/ptodata/1/ina/6_COMB.seq:*
/cgn2_6/ptodata/1/ina/bcTUS_COMB.seq:*
/cgn2_6/ptodata/1/ina/backfiles1.seq:*
 0
20000000000
                                                                                                                                                                                                                                                                                                                                                                                     1899
                                                                                                                                                                                                                                                                                                                                                                                                                                                    DΒ
US-08-125-468-1
US-08-474-93-1
US-08-22-617A-3
US-08-22-617A-3
US-08-22-617A-24
US-08-22-617A-24
US-08-22-617A-24
US-08-22-617A-24
US-08-25-876-815
US-08-4510-6468-15
US-08-45-837-17
US-08-45-837-17
US-08-45-646A-17
US-08-45-646A-17
US-08-45-646A-17
US-08-45-335A-17
US-08-45-314-17
US-08-45-314-17
US-08-93-11-258-11
US-08-93-13-2
US-08-93-463-14
US-08-93-463-14
US-08-93-463-14
US-08-93-463-18
US-08-93-463-19-4
US-08-93-463-19-4
US-08-93-137-2
US-08-93-138-03-004-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                    H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Search time 153.29 Seconds (without alignments) 949.362 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        561672
sequence
                                                                                                                                                                                 Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                      Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Description
                                                                                                                                                                                                                                                                                                                         Sequence
Sequence
                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                         Sequence
14, Appli
4, Appli
4, Appli
638, Appli
2, Appli
1, Appli
3, Appli
3, Appli
                                                                                                                                                                                                                                                                                       1, Appli
1, Appli
3, Appli
24, Appli
19, Appli
11, Appli
11, Appli
11, Appli
                                                                                                                                                                    15,
17,
17,
17,
17,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   903
```

QΥ

360 gctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgc 419

Query M Best Lo Matches	US-08- Sequ Pate Gen A PA T T T T T T T T T T T T T T T T T	C C C C C C C C C C C C C C C C C C C
y Match Local Similarity 51.7 hes 91; Conservative	125-468-1 ence 1, Application Usence 1, Applicant Eval, Massey 1017LE OF INVENTION: CHITLE OF INCIDENTIAL OF INVENTION: CHITLE OF	31 3.4 15664 30.8 3.4 9515 30.8 3.4 9515 30.8 3.4 9515 30.8 3.4 9515 30.8 3.4 9515 30.8 3.4 30001 30.8 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618 30.6 3.4 1618
%; Score 40; DB 1; Len %; Pred. No. 0.023; 0; Mismatches 85;	the biosynthetic cycline and tetrac rein Company Company 5,468	1 US-08-402-066-3 1 US-08-402-068-3 1 US-08-920-812-13 1 US-08-920-812-13 1 US-08-921-177-13 1 US-08-921-177-13 1 US-08-920-828-13 1 US-08-920-828-13 1 US-08-125-468-1 2 US-08-474-933-1 2 US-08-634-93-1 2 US-08-634-607-509-1 3 US-08-634-642-1 4 PCT-US95-05064-1 2 US-08-99-375-409-1 2 US-08-403-852D-16
gth 30001; Indels 0; Gaps 0;	Pathway for yline Formation and cosmids	Sequence 3, Appli Sequence 13, Appl Sequence 13, Appl Sequence 13, Appl Sequence 13, Appl Sequence 13, Appli Sequence 1, Appli

```
멍
                                                                    В
                                Qy
                                                                                                   Ş
                                                                                                                                                                                                                             ; MOLECULE TYPE: US-08-474-933-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-08-474-933-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 1, Application Patent No. 5866410 GENERAL INFORMATION:
                                                                                                                                         Matches
                                                                                                                                                          Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                   FILING DATE: 22-SEP-1993
ATTORNEY/AGENT INFORMATION:
NAME: Tsevdos, Estelle J
REGISTRATION NUMBER: 31,145
REFERENCE/DOCKET NUMBER: 31,255-02
TELECOMMUNICATION INFORMATION:
TELEPHNE: (201)831-3341
TELEFAX: (201)831-3305
                                                                                                                                                                                                                                                                                                                                               TELEFAX: (201)831-330:
INFORMATION FOR SEQ ID NO:
   9584
                                                                      9524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM CC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                SEQUENCE CHARACTERISTICS:
LENGTH: 30001 base pai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: Cloning of the biosynthetic pathway for TITLE OF INVENTION: chlortetracycline and tetracyline Formation and cosmids TITLE OF INVENTION: useful therein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Strathy, Nancy APPLICANT: Fantini, Susan E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9644 CAACCTGCTGGTGAACGCGGCGCAGTCGGCGCACGCCCACCGGCTGACGGCCGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9584 CTGCCTGCAGTTCACCAGCGGCACCACCGGCGCGCCGAAGACCGTCCGGCTCAGCCACCG
                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480 gaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacg 535
                                                                                                                                                                                                                                                                                STRANDEDNESS:
                                                                                                                                                                                                                                                                 TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                     gtatttgcaatacacctccgggtccacccgcacgccgctggcgtggtgatgtcccatca 479
                                                                                          gctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgc 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gtatttgcaatacacctccgggtccacccgcacgccgctggcgtggtgatgtcccatca 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CTGCCTGCAGTTCACCAGCGGCACCAGCGGCGCCGAAGACCGTCCGGCTCAGCCACCG 9643
                                                                   91;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          07470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           T: One Cyanamid 
Wayne
                                                                                                                                                                                                                                                                                            nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Application US/08474933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Lotvin, Jason A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ryan, Michael J.
                                                                                                                                                                                                                                                                 linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           American Cyanamid Company
e Cyanamid Plaza
                                                                                                                                                                                                                                               DNA (genomic)
                                                                                                                                                                                                                                                                                 single
                                                                                                                                                          4.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US 08/125,468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/08/474,933
                                                                                                                                                                                                                                                                                                                                                      1:
                                                                                                                                        0;
                                                                                                                                                          Score 40; DB 2;
Pred. No. 0.023;
                                                                                                                                        Mismatches
                                                                                                                                                                          DB 2;
                                                                                                                                         85;
                                                                                                                                                                          Length 30001;
                                                                                                                                        Indels
                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9699
                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9583
                                                                                                                                        0;
```

```
RESULT 4
US-08-222-617A-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; TYPE: DNA; ORGANISM: Pseudomonas US-09-354-129-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 3
US-09-354-129-7/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: Microsoft Office 97
SEQ ID NO 7
LENGTH: 1899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
APPLICANT: YE, RICK W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 3, Application US/08222617A Patent No. 5882879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 7, Application US/09354129 Patent No. 6136588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/09/354,129
CURRENT FILING DATE: 1999-07-15
EARLIER APPLICATION NUMBER: 60/093,181
EARLIER FILING DATE: July 17, 1998
NUMBER OF SEQ ID NOS: 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION: GENES ENCODING DENITRIFICATION REACTIONS FILE REFERENCE: \text{CL-}1255
COMPUTER READABLE FORM:
MEDIOM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                         APPLICANT: Van Liempt, Henk
APPLICANT: Montenegro, Eduardo P.
TITLE OF INVENTION: A Method for Influencing Beta-Lactam
TITLE OF INVENTION: Antibiotic Production and for Isolat
TITLE OF INVENTION: Quantities of ACV Synthetase
NUMBER OF SEQUENCES: 27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9644 CAACCTGCTGGTGAACGCGGCGCAGTCGGCCGACGCCGACGGCCGACG
                                                                                                                                                                                                                      CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         139 ctcgagtacgtcgtcgcctatctcggcgcgttgcaggccgggcgcatcgccgttgccgctt 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   927 CTCGTCCAGTTCGTCGGCCGCCGCCGCCGTCATGATCGTCGCTGTCGTCGCCGGGCCGGTC 868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      480 gaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             807 GCGCTCGCCTTTCCTTTGAGAATCCTTTTCGCGCACGGCAATGTG 763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              259 ccggtggccattctcactacatcgtctgccgtggacgacgtcgtg 303
                                                                                                                                         STATE:
                                                                                                                                                               CITY:
                                                                                                      ZIP: 60606
                                                                                                                        COUNTRY:
                                                                                                                                                                               STREET:
                                                                                                                                                                                                      ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tcggttccacaaggcggcgttaccgatgaacgttccgattcggtactgagtgattcgtcg 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GACATTGACCATCTCCGCCATGGCGAGGATTTTTTTCGAACCGGTTGAGAATGAACGGGCT 808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                85;
                                                                                                                                                             Chicago
                                                                                                                                         Illinois
                                                                                                                                                                             E: McDonnell Boehnen Hulbert & Berghoff 300 South Wacker Drive
                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                    Barredo, Jose L.
                                                                                                                                                                                                                                                                                                                                                                                                                       Gutierrez, Santiago
                                                                                                                                                                                                                                                                                                                                                                                                                                       Martin, Juan F. Garcia, Bruno D.
                                                                                                                                                                                                                                                                                                                                                             Palissa, Harriet
                                                                                                                                                                                                                                                                                                                                                                                  Von Doehren, Hans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Veenstra, Annemarie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sp. strain G-179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 37; DB Pred. No. 0.05 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  H
    Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; 08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                    Isolation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                  of Large
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
```

0;

```
OTHER INFORMATION: /note= "NNN-GCC, OTHER INFORMATION: Xaa=Ala or Ser " US-08-222-617A-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 3.9%;
Best Local Similarity 55.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                     Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                       08-222-617A-24
                                                                                                                          APPLICANT: Palissa, name APPLICANT: Van Liempt, Henk
APPLICANT: Wontenegro, Eduardo P.
APPLICANT: Montenegro, Eduardo P.
TITLE OF INVENTION: A Method for Influencing Beta-Lactam
TITLE OF INVENTION: Antibiotic Production and for Isolat!
TITLE OF INVENTION: Quantities of ACV Synthetase
TITLE OF SEQUENCES: 27
                                                                                                                                                                                                                                                                                                                                                                                                                     equence 24,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION:
REFERENCE/DOCKET NUMBER: 97,157
INFORMATION FOR SEQ ID NO: 3:
                                                  STREET: Chicago
CITY: Chicago
TMATE: Illinois
                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION DATA:
APPLICATION NUMBER: US
FILING DATE: 04-APR-19
CLASSIFICATION: 435
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                        CORRESPONDENCE ADDRESS:
ADDRESSEE: McDonnell Boehnen Hulbert & Berghoff
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8262 GTCTC 8266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8142 CGCATATGTCATCTTCACCTCGGGAACCACAGGCAAGCCCAAGGGGGGTTCTGGTGGAGCA 8201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM: Acremonium chrysogenum FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY: lin
MOLECULE TYPE:
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 11601 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   417 cgcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtccca 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          537 gattc 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              477 tcagaacgttcgggttaatttcggaacagctgatgtctggctactttgcggataccgacgg 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LOCATION: 388..11526
OTHER INFORMATION: /function= "Enzyme"
OTHER INFORMATION: /product= "ACV Synthetase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OTHER INFORMATION: OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCAGAGCGTAGTCCAGCTGCGCAATTCCCTCATCGAGCGATACTTCGGCGAGACCAACGG 8261
                                                                                                                                                                                                                                                                                                                                                                                       INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69;
                                     60606
                                                                                                                                                                                                                                                                                                                                                                                                     4, Application US/08222617A 5882879
                                                                                                        300 South Wacker Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                             Gutierrez, Santi
Barredo, Jose L.
                                                                                                                                                                                                                                                                               Von Doehren, Hans
                                                                                                                                                                                                                                                                                                                               Martin, Juan F. Garcia, Bruno D.
                                                                                                                                                                                                                                                                                                                                                                   veenstra,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
8050..8052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          04-APR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   single
                                                                                                                                                                                                                                                                                                                                                                     Annemarie E.
                                                                                                                                                                                                                                                                                                                 Santiago
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US/08/222,617A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 35.4; D
Pred. No. 0.4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGU,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 11601;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          UCU, UCC, UCA, or UCG;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                          Isolation of Large
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                              CURRENT APPLICATION NUMBER: US/09/320,878A
CURRENT FILING DATE: 1999-05-27
EARLIER APPLICATION NUMBER: CIP OF 09/141,908
EARLIER FILING DATE: 1998-08-28
EARLIER APPLICATION NUMBER: CIP OF 09/073,538
EARLIER FILING DATE: 1998-05-06
EARLIER FILING DATE: 1997-04-30
EARLIER FILING DATE: 1997-04-30
EARLIER APPLICATION NUMBER: G0/119,139
EARLIER APPLICATION NUMBER: 60/119,139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-320-878-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-222-617A-24
                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                             Sequence 19, Application US/09320878A Patent No. 6117659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 3.9%;
Best Local Similarity 55.2%;
Matches 69; Conservative
                                                                                                                                                                                                                           APPLICANT: BETLACH, MARY C.
APPLICANT: McDANIEL, Robert
APPLICANT: TANG, Li
TITLE OF INVENTION: RECOMBINANT NARBONOLIDE POLYKETIDE SYNTHASE
FILE REFERENCE: 300622002120
                                                                                                                                                                                                                                                                                                             APPLICANT: ASHLEY, Gary
APPLICANT: BETLACH, Melanic
APPLICANT: BETLACH, Mary C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE/DOCKET NUMBER: 9
INFORMATION FOR SEQ ID NO: 24:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: nucleic acid STRANDEDNESS: single-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TOPOLOGY: linear
MOLECULE TYPE: DNA (genomic)
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SOFTWARE: PatentIn Rel CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8262 GTCTC 8266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8202 CCAGAGCGTAGTCCAGCTGCGCAATTCCCTCATCGAGCGATACTTCGGCGAGACCAACGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8142 CGCATATGTCATCTTCACCTCGGGAACCACAGGCAAGCCCAAGGGGGGTTCTGGTGGAGCA 8201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 417 cgcgtatttgcaatacacctccgggtccaccccgcacgcccgctggcgtggtgatgtccca 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       537 gattc 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 477 tcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacgg 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US/U
FILING DATE: 04-APR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OTHER INFORMATION: /note= "NNN-AGU, AGC, UCU, UCC, UCA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OTHER INFORMATION: /product= "ACV Synthetase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LOCATION: 388..11526
OTHER INFORMATION: /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC
OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLASSIFICATION:
  APPLICATION NUMBER: 60/100,880 FILING DATE: 1998-09-22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PatentIn Release #1.0, Version #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Acremonium chrysogenum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8050..8052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                      Melanie C.
998-09-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /function= "Enzyme"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/08/222,617A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    97,157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 35.4; D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .
25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 11601;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; TYPE: DNA
; ORGANISM: Streptomyces venezuelae
US-09-320-878-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-08-510-646B-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOFTWARE: PatentIn
SEQ ID NO 19
LENGTH: 38506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Best Local Similarity Matches 113; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EARLIER FILING DATE: 1998-05-28 NUMBER OF SEQ ID NOS: 34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              34721
                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: ITITLE OF INVENTION: ITITLE OF INVENTION: (NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        34781 cgaagagatggcagaacccacggtgaccgacctgacgggggccctcacgcagccccc 34840
                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                       CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                  PRIOR APPLICATION DATA:
APPLICATION NUMBER: |
FILING DATE: 10-MAY--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                  PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             693 gatggccagcgattttcacgccttttcggcagcagcaatttcgcctttgaactagcggc 752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           634 cccgcggtgctcaccagcccggtgtcgttcctgcagcgcccggcccggtggatgca-ctt 692
                                                                                                                                                                                                   COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Roless "."
                                                                                                                                                        APPLICATION NUMBER: FILING DATE: 03-AUC
                                                                                                                                                                                                                                                                                                             COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                 STREET:
                                APPLICATION NUMBER: PCT/FR 93/00923 FILING DATE: 25-SEP-1993
                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccgcggcatccactggatccacgccgcgaacggcgacccgtacgcc 34946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cagcggtagcgagcggtacaggccgcgacgatcaagcgcttcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      acgaagaacaaccgacgacgaccatggccgggcgtgacctcggcaacatactgaccatcct 812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cccgcggcgcgcccgatgcccgcgtcgtgcagcccccgaccagccttatcgaaggagcgg 34780
                                                                                                                                                                                                                                                                                             RY: USA
20005-3315
                                                                                                                                                                                                                                                                                                                                            Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7, Application US/08510646B 6077699
                                                                                                                                                                                                                                                                                                                             D.C
                                                                                                                                                                                                                                                                                                                                                              E: Finnegan, Henderson, Farabow, 1300 I Street, N.W., Suite 700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lacroix, Patricia
Thibaut, Denis
Zagorec, Monique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  De Crecy-Lagard, Valerie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Jacques, Nathalie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Crouzet, Joel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Debussche, Laurent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Blanche,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                         PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Blanc,
                                                                                                                                                      03-AUG-1995
                                                                                    10-MAY-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Veronique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3.98;
                                                                                                                                                                                                                                                                                                                                                                                                                   Coding For These Polypeptides
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Polypeptides Involved In The
Biosynthesis Of Streptogramins, Nucleotide Sequences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Patricia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Francis
                                                                                                    US 08/403,852
                                                                                                                                                                      US/08/510,646B
FR 92/11441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 34.8;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches 112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 3; Length 38506;
                                                                                                                                                                                                                                                                                                                                                                                 Garrett & Dunner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                    And Their Use
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
```

```
B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-471-119A-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-510-646B-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 56; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 1, Application US/08471119A Patent No. 5827706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INFORMATION FOR SEQ ID NO: 17:
                            REFERENCE/DOCKET NUMBER: 26,389
REFERENCE/DOCKET NUMBER: 10
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                       CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                           COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1966 CCGCCTACGTCATCTACACCTCCGGCTCCACCGGCCTGCCCAAGGGCGTGCCCGTCCCGC 2025
                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Kassenoff, Melvyn
                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2026 ACCGCAGCGTGGCGTCCGTTCTCGTCCCCCTGAT 2059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FILING DATE: 25-SEP-1992 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION:
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HYPOTHETICAL:
ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     416 ccgcgtatttgcaatacacctccgggtccacccgcacgccgctggcgtggtgatgtccc 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       476 atcagaacgttcgggttaatttcgaacagctgat 509
                                                                                                                                                                                     COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
                                                                                                                      CLASSIFICATION:
                                                                                                                                   APPLICATION NUMBER: US/OFILING DATE: 06-JUN-1995
                                                                                                                                                                                                                                                                             COUNTRY: U: ZIP: 07936
                                                                                                                                                                                                                                                                                                               STATE:
                                                                                                                                                                                                                                                                                                                              CITY: East
                                                                                                                                                                                                                                                                                                                                                ADDRESSEE: No. 5827
STREET: 59 Route 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY: CDS
LOCATION: 1..2219
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORGANISM:
                 TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRANDEDNESS: double TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Meyers, Kenneth
                                                                                                                                                                                                                                                                                                               New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2219 base pairs
                                                                                                                                                                                                                                                                                               USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Leitner, Ernst
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Schneider, Elisabeth
Schoergendorfer, Kurt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (202)
201 503 8807
                                                                                                                                                                                                                                                                                                                                                                                                                                      Weber,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             s. virginiae
                                                                                                                                                                                                                                                                                                                                 Hanover
                                                                                                                                                                                                                                                                                                                                                                  No. 5827706artis Corporation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ŏ
                                                                                                                                                                                                                                           Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (202) 408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  genomic DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   408-4400
                                                                                                                                                                                                                                                                                                                                                                                                                                    Gerhard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3.78;
                                                                                                                                                                                                                                                                                                                                                                                                                  Cyclosporin Synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product = "virginiamycin s synthase gene"
                                                                                                                                                        US/08/471,119A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25,146
                                                  100-8029/CONT/CONT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         03806.0054-01000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 33.2; DB 3; Pred. No. 0.92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
```

INFORMATION FOR SEQ ID NO:

SEQUENCE CHARACTERISTICS

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; ORGANISM: Tolypocladium niveum ; STRAIN: ATCC 34921 US-08-471-119A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-08-403-852D-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 15, Appli
Patent No. 5891695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Blanc,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     31623 GCCTATGTCATCTTCACCTCCGGGTCAACTGGCCGTCCCAAGGGCGTGATGATCGAGCAT 31682
                                                                                                                                                                                                        MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
ATTORNEY/AGENT INFORMATION:
NAME: Meyers, Kenneth J.
REGISTRATION NUMBER: 25,146
REFERENCE/DOCKET NUMBER: 03806.0054-00000
TELECOMMUNICATION INFORMATION:
                                                                                           PRIOR APPLICATION DATA:
APPLICATION NUMBER: PCT/
FILING DATE: 25-SEP-1993
PRIOR APPLICATION DATA:
APPLICATION NUMBER: FR 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TOPULCE TYPE: DN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HYPOTHETICAL:
ANTI-SENSE:
                                                                                                                                                                                                                                                                                                                                                                                                                           NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   478 cagaacgttcgggttaatttcgaacag 504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       418 gcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccat 477
                                                                                                                                                                                                                                                                                                                                                           STREET:
CITY: V
                                                                                FILING DATE:
                                                                                                                                                                           APPLICATION NUMBER: US/0 FILING DATE: 10-MAY-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                           COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGCAATATTCTGCGCCTTGTCAAGCAG 31709
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      53;
                                                                                                                                                                                                                                                                                                          20005-3315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                         Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nucleic acid
                                                                                                                                                                                                                                                                                                                                            D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Application US/08403852D
                                                                                                                                                                                                                                                                                                                                                                        E: Finnegan, Henderson, Farabow, 1300 I Street, N.W., Suite 700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 46899 base pairs
                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                     De Crecy-Lagard, Valerie
JENTION: Polypeptides Involved In The
JENTION: Biosynthesis Of Streptogramins,
CENTION: Coding For These Polypeptides A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Thibaut, Denis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Crouzet, Joel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Debussche, Laurent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Zagorec, Monique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Lacroix, Patricia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Jacques, Nathalie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Blanche, Francis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unknown
                                                                           UMBER: FR 92/11441
25-SEP-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Veronique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3.6%;
60.9%;
                                                                                                                                             PCT/FR 93/00923
                                                                                                                                                                                            US/08/403,852D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 32.6; D
Pred. No. 5.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                            Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB
                                                                                                                                                                                                                                                                                                                                                                                        Garrett & Dunner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 46899;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                        And Their Use
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
```

```
Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-510-646B-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-08-403-852D-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
Matches 43; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX: (202) 408-4400 INFORMATION FOR SEQ ID NO: [
                       APPLICATION NUMBER: US 0 FILING DATE: 10-MAY-1995 PRIOR APPLICATION DATA:
                                                                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HYPOTHETICAL: r
                                                                 CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                          CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                  NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              416 ccgcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtccc 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         286 A 286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    476 a 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               226 CGGCGTACGTCATCCACACCTCCGGCTCCACCGGCACCCCCAAGGCCGTCGTCATGCCCC 285
                                                                                                                                       COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                                               APPLICATION NUMBER: FILING DATE: 03-AU
                                                                                                                                                                                                                                                       CITY: Washington
                                                                                                                                                                                                                                                                      STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME/KEY: CDS
LOCATION: 3..485
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS:
             APPLICATION NUMBER:
                                                                                                                                                                                                                            COUNTRY:
                                                                                                                                                                                                                                         STATE:
                                                                                                                                                                                                                                                                                   ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM: S.pristinaespiralis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 485 base pairs
                                                                                                                                                                                                                20005-3315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6077699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nucleic acid
                                                                                                                                                                                                                                         D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Application US/08510646B
                                                                                                                                                                                                                                                                    E: Finnegan, He
1300 I Street,
                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                                                                                                                                                       Debussche, Laurent
De Crecy-Lagard, Valerie
                                                                                                                                                                                                                                                                                                                                                                                                   Zagorec, Monique
                                                                                                                                                                                                                                                                                                                                                                                                                Thibaut, Denis
                                                                                                                                                                                                                                                                                                                                                                                                                                              Jacques,
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Crouzet,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Blanche, Francis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                 Lacroix,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Blanc,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N
O
                                                                                             UMBER: US/08/510,646B
03-AUG-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cDNA
25-SEP-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Veronique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3.6%;
70.5%;
                                                                                                                                                                                                                                                                                                                           Polypeptides Involved In The
Biosynthesis Of Streptogramins,
Coding For These Polypeptides A
                                                                                                                                                                                                                                                                                                                                                                                                                                 Patricia
                                                                                                                                                                                                                                                                                                                                                                                                                                              Nathalie
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Joel
                                                       US 08/403,852
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product= "Partie
              PCT/FR 93/00923
                                                                                                                                                                                                                                                                      Henderson, Farabow, Garrett & Dunner t, N.W., Suite 700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      32.2;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         du gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . 95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                             And
                                                                                                                                                                                                                                                                                                                                         Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                            Sequences
```

0;

ATTORNEY/AGENT INFORMATION: NAME: Meyers. Kenneth T

APPLICATION NUMBER: FR 9 FILING DATE: 25-SEP-1992

FR 92/11441

```
US-08-258-261B-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ㅁ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-08-510-646B-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 17, Application US/08258261B Patent No. 5639949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Best Local Similarity 70.5
Matches 43; Conservative
                                                                                                                                                                                                                                                         APPLICANT: Ligon, James M.

APPLICANT: Beck, James Joseph
APPLICANT: Hill, Dwight Steven
APPLICANT: Hill, Dwight Steven
APPLICANT: Ryals, John Andrew
APPLICANT: Gaffney, Thomas Deane
APPLICANT: Lam, Stephen Ting
APPLICANT: Hammer, Phillip E.
APPLICANT: Uknes, Scott Joseph
TITLE OF INVENTION: Genes for the synthesis of
TITLE OF INVENTION: antipathogenic substances
NUMBER OF SEQUENCES: 22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEFAX: (202) 408-4400
INFORMATION FOR SEQ ID NO: 1
SEQUENCE CHARACTERISTICS:
                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME: Meyers, Kenneth J.

REGISTRATION NUMBER: 25,146
REFERENCE/DOCKET NUMBER: 03806.0054-01000
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE: CI
HYPOTHETICAL: NO
ANTI-SENSE: NO
                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  476 a 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           286 A 286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                226 CGGCGTACGTCATCCACACCTCCGGCTCCACCGGCACCCCCAAGGCCGTCGTCATGCCCC 285
                                                                                                                                                                            STATE:
                                                                                                                                                                                                     ADDRESSEE: Ciba-Gergy Comments: 7 Skyline Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY: CDS
LOCATION: 3..485
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TYPE: nucleic acid
STRANDEDNESS: double
APPLICATION NUMBER: US/0 FILING DATE: 08-JUN-1994
                                                                                                                                                        COUNTRY:
                                                                                                                                                                                           CITY: Hawthorne
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM: S.pristinaespiralis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH:
                                                                                                                                          10532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                485 base pairs
                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Schupp, Thomas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              linear
                                                                                                                                                                                                                             Ciba-Geigy Corporation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (202) 408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3.6%;
70.5%;
                 US/08/258,261B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product= "Partie du
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 32.2; DB Pred. No. 0.95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                    Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SnbE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 485;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
```

```
US-08-456-837-17
; Sequence 17, Application US/08456837
; Patent No. 5643774
; GENERAL INFORMATION:
                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                  QУ
                                                                                                                                              B
                                                                                                                                                                                                                                                                                       맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                US-08-258-261B-17
                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
Matches 82; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE: 919-541-86
TELEFAX: 919-541-8689
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: nucleic acid
STRANDEDNESS: single
TOPOLLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REFERENCE/DOCKET NUMBER: CG
TELECOMMUNICATION INFORMATION:
TELEPHONE: 919-541-8614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OTHER INFORMATION: FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                              1081 CGAGGCGGTGGACGATGAGTCGCCGCTGCTGGCGATGAACATCAC 1125
                                                                                                                                                                                                                  1021 CGCGCCTCGCCTGGATGTACTGGCGCTGATCCCCTACCGCCAGATCGCCGAACGCGGTTT 1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE: 01-JUN-1995
ATTORNEY/AGENT INFORMATION:
   APPLICANT:
                                                                                                                                                                    234 cgattcggtactgagtgattcgtcgccggtggccattctcactac
                                                                                                                                                                                                                                             174 ggccgggcgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttc 233
                                                                                                                                                                                                                                                                                                           114 cgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgca 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY: CDS
LOCATION: 230..1594
OTHER INFORMATION: //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE:
                                                                                                                                                                                                                                                                                       NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OTHER INFORMATION: /gene= "phz3"
OTHER INFORMATION: /label= ORF3
OTHER INFORMATION: /note= "Open
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                               OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LOCATION: 3597..42
OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY: misc_feature LOCATION: 3597..4262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NAME/KEY: CDS
LOCATION: 1598..2758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Elmer, James Scott
Schupp, Thomas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
2764..3597
                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                misc_feature
1..4603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                         3.6%;
49.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /label- ORF4
/note- "Open Reading Frame #4 of DNA sequence. This
/note- "Open Reading Frame #4 of DNA sequence. This
is repeated in SEQ ID NO:21 due to overlapping ()RFS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note= "Open Reading Frame #1 for DNA sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Example 18 of the specification."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene= "phz1"
/label= ORF1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene= "phz2"
/label= ORF2
/note= "Open Reading
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "Four open reading frames
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       36,129
BER: CGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            08/457,205
                                                                                                                                                                                                                                                                                                                                                         Score 32.2; Di
Pred. No. 2.6;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Reading
                                                                                                                                                                                                                                                                                                                                                                             .
6
                                                                                                                                                                                                                                                                                                                                                                                             DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Frame #3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Frame #2 for DNA sequence"
                                                                                                                                                                                                                                                                                                                                                           83;
                                                                                                                                                                                                                                                                                                                                                                                             Length 4603;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNA sequence"
                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                              0
```

APPLICANT:

Ligon, James M. Beck, James Joseph Hill, Dwight Steven

```
TELEFAX: 919-541-8689 INFORMATION FOR SEQ ID NO: 17:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 4603 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE: 01-JUN-1995
APPLICATION NUMBER: 08/21
FILING DATE: 08-JUN-1994
ATTORNEY/AGENT INFORMATION:
NAME: Elmer, James Scott.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER: IBM PC COMPATIBLE OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION: Genes for the synthesis of TITLE OF INVENTION: antipathogenic substances NUMBER OF SEQUENCES: 22
CORRESPONDENCE ADDRESS:
                                FEATURE:
                                                                                                                                               NAME/KEY: CDS
LOCATION: 2764..359
OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                            NAME/KEY: CDS
LOCATION: 1598..275
OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                 MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/457,205
                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELECOMMUNICATION INFORMATION: TELEPHONE: 919-541-8614
                                                                                                                                   EATURE:
                                LOCATION: 3597..4262
OTHER INFORMATION: /label= ORF4
OTHER INFORMATION: /note= "Open Reading Frame #4 of DNA sequence. This informa
OTHER INFORMATION: is repeated in SEQ ID NO:21 due to overlapping ORFs."
 NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                               NAME/KEY: CDS
LOCATION: 230..159
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                OTHER INFORMATION: OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REGISTRATION NUMBER: 36,129
REFERENCE/DOCKET NUMBER: CG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME: Elmer, James Scott
REGISTRATION NUMBER: 36,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILING DATE: 01 CLASSIFICATION:
                                                                                                                NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hawthorne
NY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7 Skyline Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   919-541-8689
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Lam, Stephen Ting
Hammer, Phillip E.
Uknes, Scott Joseph
WENTION: Genes for the synthesis of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                               CDS
230..1594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaffney,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ryals, John Andrew
                                                                                               misc_feature
3597..4262
                                                                                                                                                                                                                                                                                                CDS
1598..2758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    linear
misc_feature
1..4603
                                                                                                                                                                                                   2764..3597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ciba-Geigy Corporation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NUMBER: US/08/456,837
01-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Thomas Deane
                                                                                                                                             /gene= "phz3"
/label= ORF3
/note= "Open Reading Frame #3 for DNA sequence"
                                                                                                                                                                                                                                                                                                                                           /gene= "phz1"
/label= ORF1
/note= "Open I
                                                                                                                                                                                                                                                /label= ORF2
/note= "Open
                                                                                                                                                                                                                                                                               /gene= "phz2"
                                                                                                                                                                                                                                                                                                                                                  /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      08/258,261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGC 1506/CIP3
                                                                                                                                                                                                                                                Reading Frame
                                                                                                                                                                                                                                                                                                                                                Reading Frame #1 for DNA sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Version
                                                                                                                                                                                                                                                 #2
                                                                                                                                                                                                                                                 for
                                                                                                                                                                                                                                                DNA sequence"
```

```
Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; OTHER INFORMATION:
; OTHER INFORMATION:
; OTHER INFORMATION:
US-08-456-837-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-457-342-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Sequence 17
; Patent No.
; GENERAL IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 3.6
Best Local Similarity 49.7
Matches 82; Conservative
              TELEPHONE: 919-541-8614
TELEFAX: 919-541-8689
INFORMATION FOR SEQ ID NO: 1
SEQUENCE CHARACTERISTICS:
                                                                                                               PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/457,20
EILING DATE: 01-JUN-1995
APPLICATION NUMBER: 08/258,261
FILING DATE: 08-Jun-1994
ATTORNEY/AGENT INFORMATION:
NAME: Elmer; James Scott
REGISTRATION NUMBER: 36,129
RETERBATE COURTE NUMBER: 36,129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Hammer, Phillip E.
APPLICANT: Uknes, Scott Joseph
TITLE OF INVENTION: Genes for the synthesis
TITLE OF INVENTION: antipathogenic substance
NUMBER OF SEQUENCES: 22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1081 CGAGGCGGTGGACGATGAGTCGCCGCTGCTGGCGATGAACATCAC 1125
                                                                                 REGISTRATION NUMBER: 36,129
REFERENCE/DOCKET NUMBER: CGC
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1021 CGCGCCTCGCCTGGATGTACTGGCGCTGATCCCCTACCGCCAGATCGCCGAACGCGGTTT 1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 114 cgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgca 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE: 01-JUN CLASSIFICATION: 424
                                                                                                                                                                                                                                                                                                                        OPERATING SYSTEM:
SOFTWARE: PatentI
                                                                                                                                                                                                                                                                                                                                                           COMPUTER:
                                                                                                                                                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                           COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                              STATE:
 LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ggccgggcgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttc 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cgattcggtactgagtgattcgtcgccggtggccattctcactac 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      17,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                            10532
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Hawthorne
                                                                                                                                                                                                                                                                                                                                                                                                                                              Ϋ́
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Application
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ryals, John Andrew
Gaffney, Thomas Deane
Lam, Stephen Ting
Hammer, Phillip E.
4603 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7 Skyline Drive
                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hill, Dwight Steven
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Beck, James Joseph
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ligon, James
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Schupp, Thomas
                                                                                                                                                                                                                                                                                                                          PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                        IBM PC compatible SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ciba-Geigy Corporation
                                                                                                                                                                                                                                                                     01-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3.6%;
49.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US/08457342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Example 18 of the specification."
                                                                                                                                                                                                                     US 08/457,205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Four open reading frames
                                                                                                                                                                                                                                                                                        US/08/457,342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 32.2;
Pred. No. 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                    1506/CIP3
                                                                                                                                                                                                                                                                                                                          Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 substances
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 4603;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                             US-08-457-646A-17
                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-457-342-17
                                                                                                                                                                                                                                                 Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local 9
                                                                                                                                                                                                                                                                  Sequence 17,
                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                            APPLICANT: Hammer, Philip ...
APPLICANT: Uknes, Scott Joseph
TITLE OF INVENTION: Genes for the s
TITLE OF INVENTION: antipathogenic
TITLE OF SEQUENCES: 22
                                                                                                                                                                         APPLICANT:
                                         CORRESPONDENCE ADDRESS:
                                                                                                                 APPLICANT:
                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                  1021 CGCGCCTCGCCTGGATGTACTGGCGCTGATCCCCTACCGCCAGATCGCCGAACGCGGTTT 1080
                                                                                                                                              APPLICANT:
                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                          1081 CGAGGCGGTGGACGATGAGTCGCCGCTGCTGGCGATGAACATCAC 1125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY: lir
                                                                                                                                                                                                                                                                                                                                                                     234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            114 cgtggtgatctctgctccgcagggactcgagtacgtcgtcgtcgcctatctcggcgcgttgca 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OTHER INFORMATION: /label= ORF4
OTHER INFORMATION: /note= "Open Reading Frame #4 of DNA sequence. This :
OTHER INFORMATION: is repeated in SEQ ID NO:21 due to overlapping ORFs."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LOCATION: 2764..39
OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OTHER INFORMATION:
OTHER INFORMATION:
            STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OTHER INFORMATION: OTHER INFORMATION:
                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                       cgattcggtactgagtgattcgtcgccggtggccattctcactac 278
                                                                                                                                                                                                                                                                                                                                                                                                                           ggccgggcgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttc 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                           82;
                                                                                                                                                                                                                                                      5679560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
Hawthorne
                                                                                                                                                                                                                                                                Application US/08457646A
            E: Ciba-Geigy Corporation
7 Skyline Drive
                                                                                                                                           Ryals, John Andrew
Gaffney, Thomas Deane
                                                                                                                 Lam, Stephen Ting Hammer, Phillip E.
                                                                                                                                                                        Beck, James Joseph
Hill, Dwight Steven
                                                                                                                                                                                                      Ligon, James M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                  Schupp, Thomas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
3597..4262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
230..1594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     misc_feature
1..4603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
1598..2758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2764..3597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene= "phz2"
/label= ORF2
/note= "Open Reading
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Example 18 of the specification."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene= "phz3'
/label= ORF3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Open Reading Frame #3 for DNA sequence'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Open Reading Frame #1 for DNA sequence'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene= "phz1"
/label= ORF1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 32.2; D: Pred. No. 2.6; O; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Four
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    open
                                                                                  synthesis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    reading frames
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Frame
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 4603;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           #2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This informa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
```

```
뫄
                            QУ
                                                                                                                                      US-08-457-646A-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE/DOCKET NUMBER: CGC
TELECOMMUNICATION INFORMATION:
TELEPHONE: 919-541-8614
TELEPAX: 919-541-8689
INFORMATION FOR SEQ ID NO: 17:
SEQUENCE CHARACTERISTICS:
                                                                        Query Match
Best Local Similarity
                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME/KEY: CDS
LOCATION: 230..1594
OTHER INFORMATION: /9
OTHER INFORMATION: /1
OTHER INFORMATION: /1
FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ZIP: 10532
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: nucleic acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: DNA (gen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE: 08-Jun-1994
ATTORNEY/AGENT INFORMATION:
NAME: Elmer, James Scott
REGISTRATION NUMBER: 36,
                                                                                                                                                  NAME/KEY: misc_feature LOCATION: 1.4603
OTHER INFORMATION: /note OTHER INFORMATION: Examp
                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION: 530 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                                                                                                                                        FEATURE:
                                                                                                                                                                                                                                                                                                                                   NAME/KEY: CDS
LOCATION: 2764..359
OTHER INFORMATION:
OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY: CDS
LOCATION: 1598..275
OTHER INFORMATION:
OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION DATA:
 961
                              114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                                                                                                           OTHER INFORMATION:
OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                                                                                                         NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STATE:
COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: US 08/457, FILING DATE: 01-UUN-1995
APPLICATION NUMBER: 08/258,261
FILING DATE: 08-Jun-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: FILING DATE: 01-JUI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LENGTH:
                       cgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgca 173
82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ϋ́N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4603 base pairs
                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
1598..2758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                                                                         misc_feature
3597..4262
                                                                                                                                                                                                                                                                                                                                                                                   CDS
2764..3597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-JUN-1995
                                                                        3.6%;
49.7%;
                                                                                                                                                                                                                                           /label= ORF4 /note= "Open Reading Frame #4 of DNA sequence. This is repeated in SEQ ID NO:21 due to overlapping ORFs."
                                                                                                                                                                                                                                                                                                                                                     /gene= "phz3"
/label= ORF3
                                                                                                                                                                                                                                                                                                                                                                                                                              /gene= "phz2"
/label= ORF2
/note= "Open
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Open Reading Frame #1 for DNA sequence"
                                                                                                                                                                               /note= "Four open reading frames
                                                                                                                                                    Example 18 of the
                                                                                                                                                                                                                                                                                                                                       /note-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene= "phz1"
/label= ORF1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US/08/457,646A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                36,129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           08/457,205
                                                          Score 32.2; Di
Pred. No. 2.6;
0; Mismatches
                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGC
                                                                                                                                                                                                                                                                                                                                       "Open
                                                                                                                                                                                                                                                                                                                                     Reading Frame #3
                                                                                                                                                                                                                                                                                                                                                                                                                               Reading
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Version #1
                                                                                                                                                    specification
                                                                           .
o
                                                                                          DB
                                                                                                                                                                                                                                                                                                                                                                                                                                 Frame
                                                            83;
                                                                                      1;
                                                                                                                                                                                                                                                                                                                                                                                                                                 #2
                                                                                        Length 4603;
                                                          Indels
                                                                                                                                                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                                                                                                                                                 for DNA sequence"
                                                                                                                                                                                                                                                                                                                                        DNA
                                                            0,
                                                                                                                                                                                                                                                                                                                                       sequence'
                                                            Gaps
                                                                                                                                                                                                                                                            This infor
                                                            0
```

Ω

174

ggccgggcgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttc 233

δ δ

1021 CGCGCCTCGCCTGGATGTACTGGCGCTGATCCCCCAGATCGCCGAACGCGGTTT 1080

```
RESULT 15
US-08-458-076A-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 17, Application US/08458076A Patent No. 5698425
                                                                                                                                                                                                                                                                                                                                                   FILING DATE: 01-JUN-1995

CLASSIFICATION: 435

PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/457,205

FILING DATE: 01-JUN-1995

APPLICATION NUMBER: 08/258,261

FILING DATE: 08-JUN-1994

ATTORNEY/AGENT INFORMATION:
NAME: Elmer, James Scott

REGISTRATION NUMBER: 36,129

REFERENCE/DOCKET NUMBER: CGC 1506/CIP3
                                                                                                                                                                                                                                        TELEFAX: 919-541-8689
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 4603 base pairs
TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/458,0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANTION: Genes TITLE OF INVENTION: antipathogenic TITLE OF INVENTION: antipathogenic 22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELECOMMUNICATION INFORMATION: TELEPHONE: 919-541-8614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                   FEATURE:
                                                                                             NAME/KEY: CDS
LOCATION: 230..1594
OTHER INFORMATION: //
OTHER INFORMATION: //
                                                                                                                                                                                             MOLECULE TYPE: DNA (genomic)
                                                 NAME/KEY:
LOCATION:
   OTHER INFORMATION:
OTHER INFORMATION:
                                                                                                                                                                                                              STRANDEDNESS: S1 TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE: Ciba-Geigy Corporation STREET: 7 Skyline Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hawthorne
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Hammer, Philippe
Uknes, Scott Joseph
Uknes, Scott Joseph
Genes for the synthesis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Beck, James Joseph
Hill, Dwight Steven
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaffney, Thomas Deane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ligon, James M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Lam, Stephen Ting
Hammer, Phillip E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ryals, John Andrew
                                                CDS
1598..2758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Schupp, Thomas
                                                                                                                                                                                                                           single
                                                                                             /gene= "phz1"
/label= ORF1
/note= "Open Reading Frame #1 for DNA sequence"
/gene= "phz2"
/label= ORF2
/note= "Open Reading
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US/08/458,076A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Version
    Frame
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of
    #2
    for
   DNA sequence"
```

Search completed: January 12, Job time: 26521 sec

2001, 20:14:13

```
Qy
  밁
                                        γ
                                                                                  망
                                                                                                                                                                     밁
                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                               ; OTHER INFORMATION: /note= "Four open reading frames OTHER INFORMATION: OTHER INFORMATION: Example 18 of the specification." US-08-458-076A-17
                                                                                                                                                                                                                                                    Query Match 3.6%;
Best Local Similarity 49.7%;
Matches 82; Conservative
  1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURE:
                                                                                  1021 CGCGCCTCGCCTGGATGTACTGGCGCTGATCCCCCTACCGCCAGATCGCCGAACGCGGTTT 1080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY: CDS
LOCATION: 2764..359:
OTHER INFORMATION:
OTHER INFORMATION:
OTHER INFORMATION:
                          234 cgattcggtactgagtgattcgtcgccggtggccattctcactac 278
                                                                                                           174 ggccgggcgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttc 233
                                                                                                                                                                                         114 cgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgca 173
                                                                                                                                                                   NAME/KEY: misc_feature LOCATION: 1..4603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OTHER INFORMATION: /label= ORF4
OTHER INFORMATION: /note= "Open Reading Frame #4 of DNA sequence. This
OTHER INFORMATION: is repeated in SEQ ID NO:21 due to overlapping ORFs."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OTHER INFORMATION: OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY: misc_feature LOCATION: 3597..4262
                                                                                                                                                                                                                                                                                                                                                                                                                                                    LOCATION:
CGAGGCGGTGGACGATGAGTCGCCGCTGCTGGCGATGAACATCAC 1125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
2764..3597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note= "Open Reading Frame #3 for DNA sequence"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene= "phz3"
/label= ORF3
                                                                                                                                                                                                                                                      Score 32.2; DB 1; Length 4
Pred. No. 2.6;
0; Mismatches 83; Indels
                                                                                                                                                                                                                                                                                                Length 4603;
                                                                                                                                                                                                                                                        0
                                                                                                                                                                                                                                                        0;
```

			e e e e e e e e e e e e e e e e e e e		· · · · · · · · · · · · · · · · · · ·		•									
jorgan ×j	Barran	,	er est	an giriya — we	· 190	जी कर चंका स्थापन	• •	eric o	ti vija, komentek	e i mataja rejaj	production of the	- She	ها الحوا	4. 4.	es. •••Ω. 	cive nal
						. 4	a. District		en geri				1 1	1v		2
7.6							•		ger & A transfer Maria (A)	talis Corresponden			•	p		
								,								3
.																
٠,			,													t.
									f .							_k
												• • • •				
			•													
							. •	-								
Mark c	ju o odlače gazo	- troughts														,
er i	a en en e	Control of the Contro			erijing le eriperiji				ත්ත් ් මුක් වේ යන්නි				* Aurogisa	· Portion		The state of the s
																Ž,
									a.							
					÷											:

```
Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tal number of
                                                                                                                                                                               NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             900
                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                             Score
  36.2
36.2
35.4
35.4
35.4
34.8
34.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    seq length:
seq length:
                                                                                                                                                                                                                                                                                             N_Geneseq_36:*

1: /SIDS6/gcgdata/geneseq/geneseqn/NA1980.DAT:*

2: /SIDS6/gcgdata/geneseq/geneseqn/NA1981.DAT:*

3: /SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:*

4: /SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:*

4: /SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:*

6: /SIDS6/gcgdata/geneseq/geneseqn/NA1984.DAT:*

7: /SIDS6/gcgdata/geneseq/geneseqn/NA1985.DAT:*

8: /SIDS6/gcgdata/geneseq/geneseqn/NA1987.DAT:*

9: /SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:*

10: /SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*

11: /SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*

12: /SIDS6/gcgdata/geneseq/geneseqn/NA1991.DAT:*

13: /SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:*

14: /SIDS6/gcgdata/geneseq/geneseqn/NA1994.DAT:*

15: /SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*

16: /SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*

17: /SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*

18: /SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*

19: /SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*

20: /SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*

20: /SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*

21: /SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*

22: /SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*
                                                                                                                                                                        Query
Match Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         480022 seqs, 187831343 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDENTITY_NUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-461-774-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          January 12, 2001, 20:05:55;
    GenCore version 4.5
Copyright (c) 1993 - 2000 Com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gattacgaacaggactggga.....aggagagggtgaaagcttaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
20000000000
  2636
11601
13058
7673
12441
13613
23666
38506
37856
                                                                                                                         30001
30001
1318
                                                                                                                                                                              DВ
    19
12
14
19
21
21
21
21
21
                                                                                                                                                                              ij
                V49983
Q13608
Q48231
V58229
Z87284
Z87319
Q10190
Z56001
                                                                                                                       T61016
X05110
V49982
                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Search time 244.98 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (without alignments)
1384.698 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                960044
S. venezuelae deso
S. venezuelae deso
Cephalosporin anti
Recombinant cosmid
S. cellulosum DNA
                                                                                                        Total DNA sequence
S. aureofaciens DN
Floral organ-speci
Floral organ-speci
                                                                                                                                                                             Description
                                                                              ACV synthetase gen
Vector containing
                                                                    Omega-cyclohexane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             903
                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
T61016
  G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       00000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          00
                                                                                                                                                                                                                                                                                                                                                                                                            T61016;
                                                                                                                                                                                                                                                                                                                                                                                                                                      T61016 standard; DNA; 30001 BP
```

45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	
0	30.8	9	0	0	31	31	31	31	1	1.	1	1	31.6	1.	1.	1.	32	32	32	32	'n					2	۲.		'n			34	
3.4	٠		٠	3.4	٠				5	თ																					3.8		
1145	30001	30001	9515	3635	15664	15664	15664	15664	536165	534720	80161	36519	2004	1722	1615	1413	8753	2417	1209	1008	5698	5698	4603	4603	4602	13144	46899	924	1966	1127	3001	2000	
16	20	18	15	14	18	18	18	17	19	19	20	19	14	20	16	20	12	15	21	11	20	19	19	18	17	12	15	21	20	21	12	13	
T04785	X05110	T61016	Q55145	Q41652	T51224	T66130	T70492	T09312	V30459	V30458	Z21501	V22141	Q51113	X34206	Q99201	X34205	Q13285	Q56106	Z87293	Q06843	x99375	V39844	V58732	T89957	T06770	Q13288	Q54386	A12829	X04340	A02477	Q14668	Q25783	
Cellobiase gene fr	S. aureofaciens DN	ጠ	Pseudomonas aerugi	Phosphoglycerate k	NheI-G/Spel fragme	Mycobacte: iophage	Mycobacteriophage	Mycobacteriophage	Rhizobium species	obium specie	DNA fragment of Sa	Chimpanzee adenovi	Lignin peroxidase	Mycobacterium spec	Pseudomonas putida	Mycobacterium spec	ans	DNA encoding a lip	S. venezuelae deso	Secondary metaboli	P. aurofaciens phe	Pseudomonas fluore		Pseudomonas aureof	Pseudomonas aureof	P.denitrificans ge	T. niveum Cyclospo	Pseudomonas cepaci	Human secreted pro	Human colon cancer	CTP synthetase gen	CTP synthase gene	

ALIGNMENTS

```
Cosmid clone; biosynthetic particles heterologous heterol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            22-SEP-1993;
26-JUL-1990;
26-JUL-1990;
15-JAN-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Total DNA sequence from cosmid clones LP(2)127 and LP(2)128
DNA encoding tetracycline biosynthetic pathway proteins
                                                                                                                                                     WPI; 1997-076853/07.
                                                                                                                                                                                                                                                                                                          Fantini SE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            26-JUL-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31-DEC-1996.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomyces aureofaciens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US5589385-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21-APR-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                       (AMCY ) AMERICAN CYANAMID CO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15-JAN-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  host; Streptomyces lividans; ss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                          Lotvin JA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LP(2)127; LP(2)128; chlortetracycline; pathway; recombinant; production; antik
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     93US-0125468.
90US-0558039.
90US-0558040.
92US-0821109.
92US-0821419.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90US-0558039
                                                                                                                                                                                                                                                                                                  Ryan MJ,
                                                                                                                                                                                                                                                                                                          Strathy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         antibiotic,
```

```
RESULT
X05110
                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SXCCCCCX PX PT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
Matches 91; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                          15-JAN-1992;
07-JUN-1995;
                                                                                                                                                                                                                                                                                                                  US5866410-A
                                                                                                                                                                                                                                                                                                                                                                                                                  S. aureofaciens DNA in cosmid clones LP2-127 and LP2-128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9524
       Disclosure;
                                                                                               WPI; 1999-141936/12
                                                                                                                                                (AMCY ) AMERICAN CYANAMID CO
                                                                                                                                                                                                                                                                07-JUN-1995;
                                                                                                                                                                                                                                                                                         02-FEB-1999
                                                                                                                                                                                                                                                                                                                                          Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                          Chlortetracycline; tetracycline; biosynthetic; actinomycete;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           X05110 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9644 caacctgctggtgaacgcggcgcagtcggcgcacgcccaccggctgacggccgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                chlortetracycline biosynthetic pathway. The biosynthetic gene, which can be expressed in heterologous hosts, especially S. lividans, may be useful in the production of antibiotics.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The present sequence is the total DNA sequence from cosmid clones LP(2)127 and LP(2)128, which contains a Streptomyces aureofaciens (ATCC 13899) DNA that encodes the proteins of the entire
                                                       chlortetracycline,
                                                                                                                                                                                                                          22-SEP-1993;
26-JUL-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               specifically from Streptomyces aureofaciens for expression heterologous hosts, specifically S. lividans
                                             replication,
                                                                                                                                                                                                  26-JUL-1990;
15-JAN-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 30001 BP; 4055 A; 10939 C; 11019 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                 ariseofuscus;
lividans; S. a
                                                          plasmids for cloning the biosynthetic pathways of tetracycline,
ortetracycline, and their derivatives - comprise an origin of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtatttgcaatacacctccgggtccacccgcacgccgctggcgtggtgatgtcccatca 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgc 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ctgcctgcagttcaccagcggcaccaccggcgcgcgaagaccgtccggctcagccaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ψ
                                                                                                                       SE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Columns 17-44;
       Fig 4A-L; 39pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                            cohesive
                                                                                                                       Lotvin
                                                                                                                                                                                                                                                                                                                                           aureofaciens.
                                                                                                                                                                      93US-0125468.
90US-0558039.
90US-0558040.
92US-0821109.
92US-0821419.
95US-0474933.
                                                                                                                                                                                                                                                                95US-0474933
                                                                                                                                                                                                                                                                                                                                                                   aureofaciens;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA;
                                                                                                                                                                                                                                                                                                                                                                               ŝ
                                                                                                                                                                                                                                                                                                                                                               ambofaciens; antibiotic resistance gene; eofaciens; cosmid clone; antibiotic; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4.48;
                                             end sites
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      39pp; English
                                                                                                                       Ryan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .
BP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 40;
Pred. No.
                                                                                                                        Ĭ,
                                             and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                       Strathy
                                            optionally,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 18;
0.067;
                                                         comprise an origin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3988
                                             an antibiotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 30001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
```

```
RESULT
V49982
ID V4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DR XXX
                                                                                                                                                                                                                       Query Match
Best Local S
Matches 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            can be inserted into the plasmid allowing a biosynthetic pathway to be transferred in its entirety to a heterologous host. The invention specifically relates to cloning of the entire tetracycline and chlortetracycline from Streptomyces aureofaciens and its expression in heterologous host such as S. lividans. The present sequence represents S. aureofaciens DNA sequence from the cosmid clones designated LP2-127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S. ariseofuscus, or S. ambofaciens) active antibiotic resistance gene and three or more tandem cohesive end sites. The second plasmid contains an actinomycete active origin of replication and three or more tandem cohesive end sites. The invention can be used to clone a large amount of genetic material for the heterologous production of the antibiotics, chlorietracycline, tetracycline and their analogues. A cluster of genes
                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                             Oryza
                                                                                                                                                                                                                                                                                                                         Floral-organ
flower part;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       genes encoding tetracycline,
          WPI; 1998-388123/33
                                                                                                                                                                                                                                                                                                                                                                     Floral organ-specific chitinase encoding cDNA
                                                                                                                                                                                                                                                                                                                                                                                                                               V49982;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            V49982 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9644 caacctgctggtgaacgcggcgcagtcggcgcacgcccaccggctgacggccgacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9584 ctgcctgcagttcaccagcggcaccaccggcgcgcgaagaccgtccggctcagccaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 30001 BP; 4055 A; 10939 C; 11019 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The invention relates to combination of two plasmids for cloning the genes encoding the blosynthetic production pathways of chlortetracycline, their derivatives. One plasmid contains an origin of replication, an actinomycete (such as Streptomyces lividans,
                                         Inoue T,
                                                                                                   27-DEC-1996;
                                                                                                                              26-DEC-1997;
                                                                                                                                                             09-JUL-1998
                                                                                                                                                                                          WO9829542-A1
                                                                                                                                                                                                                                                                                                                                                                                                  10-NOV-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and LP2-128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacg 535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatca 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgc 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             91;
                                                                                                                                                                                                                                                                                               sativa
                                                                      JAPAN TOBACCO INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                       Ito T, Saito H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                           specific gene; chitinase; promoter; Oryza sativa; rice; monocotyledonous plant; bacterial resistance; ds.
                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                   96JP-0349505
                                                                                                                                97WO-JP04892
                                                                                                                                                                                                                                                   Location/Qualifiers 114..1100
                                                                                                                                                                                                                    /*tag= a
/product= "floral-organ specific chitinase"
                                                                                                                                                                                                                                     /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                            cdna;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4.4%;
51.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            1318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 40;
Pred. No.
                                         Takakura
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                         Υ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 20;
0.067;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 30001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ŧ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

P-PSDB; W64776

XX CCC CCC CCX XX PTT PTT XX

```
Query Match
Best Local S
Matches 68
                   exon
                                                                                                     exon
                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This cDNA encodes a floral organ-specific chitinase. The specification provides a promoter sequence (V49983) derived from rice associated with chitinase, specific to floral organs that allows expression of genes in the flower parts of monocotyledonous plants. The expression of desired genes specifically in the floral parts of monocotyledonous plants, allows modifications to be made in the structure or function of these parts allowing the introduction of desired characteristics such as increased
                                                                                                                                                                                          exon
                                                                                                                                                                                                                                                                                                                                    Oryza sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Promoter sequence associated with chitinase, specific to organs - allows expression of genes in the flower parts o monocotyledonous plants
                                                           intron
                                                                                                                                               intron
                                                                                                                                                                                                                                                                                            promoter
                                                                                                                                                                                                                                                                                                         Key
                                                                                                                                                                                                                                                                                                                                                                flower part;
                                                                                                                                                                                                                                                                                                                                                                            Floral-organ
                                                                                                                                                                                                                                                                                                                                                                                                         Floral organ-specific chitinase gene with promoter sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   V49983;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            V49983 standard; DNA; 2636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 1318 BP; 231 A; 442 C; 440 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                       10-NOV-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             resistance to bacterial attack.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            939
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         accggcggctccagtgcgccggcgaccggcgcgccgaccgggtcgcgttctacaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agcgagcgggtacaggccgcgacgatcaagcgcttcgccgaccgctttgcttcgcttcaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                actcccgcggacagcggccggccgcgccaggctacgggctcaccacgaacatcctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                acaaccgacgacgacatggccgggcgtgacctcggcaacatactgaccatcctcagcggt 819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pages
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                           specific gene; chitinase; promoter; Oryza sativa; rice;
                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                             monocotyledonous plant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33-35; 67pp;
                /*tag= e
/number= 2
1910..2108
/*tag= f
/number= 2
2109..2502
                                                                                                  /number= 1
1777..1909
                                                                                                                                                                                                                                /*tag= a
/note= "floral-organ specific promoter sequence"
1235..2505
                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                            /number=
                                                                                                                                                                                                     /product= "floral-organ-specific chitinase"
/note= "contains introns"
                                                                                                                                  /*tag=
                                                                                                                                               692..1776
                                                                                                                                                                        *tag=
                                                                                                                                                                                       235..1691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Japanese
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        36.2;
No. 0.
                                                                                                                                                                                                                                                                                                                                                                bacterial resistance;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               205 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB
. 28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1318;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   o floral
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
В
                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local S
Matches 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 along with a floral organ-specific promoter sequence. The promoter derived from rice associated with chitinase is specific to floral organs and allows expression of genes in the flower parts of monocotyledonous plants. The expression of desired genes specifically in the floral parts of monocotyledonous plants, allows modifications to be made in the structure or function of these parts allowing the introduction of desired characteristics such as increased resistance to become lattace.
                                                                                     CDS
                                                                                                                                                                                                                                Q13608
                                                                                                                                                                                                                                                                                                                                                                                                                                                   2284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Promoter sequence associated with chitinase, specific to organs - allows expression of genes in the flower parts c monocotyledonous plants
  11-SEP-1991
                                                                                                                                                                                                                                                           Q13608
                                                                                                                                                                                                                                                                                                                                  2404 c 2404
                             EP445868-A.
                                                                                                                                              Beta
                                                                                                                                                                       ACV synthetase
                                                                                                                                                                                                     22-NOV-1991
                                                                                                                                                                                                                                                                                                                                                                                       2344 accggcgggctccagtgcgccggcggcaacggcggcggccgaccgggtcgcgttctacaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 2636 BP; 657 A; 722 C; 696 G; 561 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          characteristics such as increased resistance to bacterial attack.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This represents a floral organ-specific chitinase encoding gene sequence along with a floral organ-specific promoter sequence. The promoter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 1998-388123/33.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      09-JUL-1998
                                                                                                                                                                                                                                                                                                                                                             880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P-PSDB; W64776.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (NISB ) JAPAN TOBACCO INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               27-DEC-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          26-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   W09829542-A1
                                                                                                                                                                                                                                                                                                                                                                                                                      820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity 56.1 tes 68; Conservative
                                                                                                                                                                                                                                                                                         σ
                                                                                                                                                                                                                                                                                                                                                             C
                                                                                                                                                                                                                                                                                                                                                                                                       agogagogggtacaggcogogacgatcaagogottogocgacogotttgctcgcttcaat 879
                                                                                                                                                                                                                                                                                                                                                                                                                                                               acaaccgacgacgacatggccgggcgtgacctcggcaacatactgaccatcctcagcggt 819
                                                                                                                                              lactam
                                                                                                                                                                                                                                                                                                                                                                                                                                                 actcccgcggacagcggccggccgcgcgccaggctacgggctcaccacgaacatcctc
                                                                                                                                                                                                                                                                                                                                                               880
                                                                                                                                                                                                                                                            standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pages 40-41; 67pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ito T,
                                                                                                                                           antibiotics; penicillin;
                                                                                                                                                                                                   (first entry)
                                                                                                                                                                       gene, pcbAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               96JP-0349505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97WO-JP04892
                                                                                     Location/Qualifiers 388..11526
                                                        /product= ACV synthase
                                                                                                                                                                                                                                                            DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /number=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Saito H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       56.2%;
                                                                                                                                                                                                                                                            11601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ω
                                                                                                                                                                                                                                                            ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 36.2; D. Pred. No. 0.36 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Takakura
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      36.2;
No. 0.
                                                                                                                                            SS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ۲,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 o floral
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2636;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                          2403
                                                                                                                                                                                                                                                                                                                                                                                                                                                   2343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         desired
```

0;

XXX DXXX

RESULT V49983

g Qy 밁 Qy

Дþ Qy

```
Q48231
XXX Q2
AC Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             x202020x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity 55.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            27-FEB-1991;
28-FEB-1990;
28-FEB-1990;
02-JUL-1990;
03-OCT-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The DNA sequence was obtd. from five subclones isolated from a gene library of A. chrysogenum C10 (ATCC 48). The gene can be used to express the synthetase enzyme which can be used for the prodn. of new beta-lactam anti-biotics.

See also Q13607-Q13612.
                                                                                                                                                                                                                                                                                                                        Delta-(L-alpha-aminoadipyl)-L-cystinyl-D-valine synthase; ACVS;
beta-lactam; antibiotic; transformed; cephalosporin; vector; ss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q48231;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA encoding amino:adipyl-cysteinyl-valine synthetase - prodn. of the enzyme or enhanced prodn. of new or known beta-lactam antibiotic cpds.
                                                                                                   JP05192162-A
                                                                                                                                                                                                                                                                          Acremonium
                                                                                                                                                                                                                                                                                                                                                                                                Vector containing ACVS gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                21-FEB-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q48231 standard; DNA; 13058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8262 gtctc
                                                   03-AUG-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 1; Page 20; 54pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Veenstra AE, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (KONN ) GIST-BROCADES NV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27-FEB-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                egcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtccca 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gattc 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1991-268735/37.
DB; R13896.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccagagcgtagtccagctgcgcaattccctcatcgagcgatacttcggcgagaccaacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11601 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8266
                                                                                                                                                                                                                                                                       chrysogenum
                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Martin JF, Garcia
, Von Doehren H, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            91EP-0200423.
90EP-0200475.
90EP-0200488.
90EP-0201768.
90EP-0202628.
                                                                                                                                                                 Location/Qualifiers
1458..12377
/*tag= a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 91EP-0200423
                                                                                                                                                  /product= ACVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2537 A; 3566 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 35.4; DB Pred. No. 1.1; 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BD, Guttierez S, Barredo
Palissa H, Van Liempt H;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3158 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2340 T; 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 11601;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             other
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 used
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
V58229
                       PRINTER TO THE TOTAL TRANSPORT OF THE TOTAL T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                       CDS
                                                                                                                        CDS
                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                    Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8993 cgcatatgtcatcttcacctcgggaaccacaggcaagcccaagggggttctggtggagca 9052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The sequence (Q48231) is of a vector which includes the delta-(L-alpha-aminoadipyl)-L-cystinyl-D-valine synthase gene. This sequence was transformed into a host cell to express the ACVS product. The protein produced (R40227) was then used to manufacture
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Alicyclobacillus acidocaldarius.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Omega-cyclohexane fatty acid; biosynthesis; Alicyclobacillus acidocaldarius ATCC 27009;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    V58229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9053 ccagagcgtagtccagctgcgcaattccctcatcgagcgatacttcggcgagac&aacgg 9112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA coding delta-(L-alpha-amino-adipyl) L-cystinyl D-valine synthase - for improved productivity of cephalosporin antibiotics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Omega-cyclohexane fatty acid biosynthesis enzymes #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26-NOV-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 13058 BP; 2860 A; 3915 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 1; Page 9-13; 69pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 1993-277475/35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (TAKE ) TAKEDA CHEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JUL-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    417 ogogtatttgcaatacacctccgggtccaccccgcacgcccgctggcgtggtgatgtccca 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       beta-lactam antibiotic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gtctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gattc 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacgg 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    standard; DNA; 7673 BP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R40227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                              /*tag= c
/label= ORF3
/function= "a
2847..4505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     90JP-0205677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     91JP-0186222
                    /function=
4584..5810
                                                                                                                                                                                                                                                                                                                                       /*tag= a
/label= ORF1
1797..2504
                                                                                                                                                                                                                       2535..2789
                                                                       /label= ORF4
                                                                                              /*tag=
                                                                                                                                                                                                                                                                     /function=
                                                                                                                                                                                                                                                                                            /*tag= b
/label= ORF2
                                                                                                                                                                                                                                                                                                                                                                                                                         300..1706
                                                                                                                                                                                                                                                                                                                                                                                                                                           ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IND LTD
                                           "acyl-CoA synthetase
                                                                                                                                                                                                                                           "Beta-ketoacyl (acyl carrier protein) reductase"
                                                                                                                                            "acyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 35.4; D
Pred. No. 1.2;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                            carrier
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3560 G;
                                                                                                                                            protein'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2723 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        enzyme; detection;
identification; microbe;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 13058;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ORF1-6
```

0;

Gaps

0;

encoding

ds.

```
ρ
                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                  uecometnymycin; narbomycin; polyhydroxyalkanoate monomer synthase; biopolymer; antibiotic; chemotherapeutic; immunosuppressant; asth chronic obstructive pulmonary disease; respiratory inflammation.
                                                                                                                                                                                                                                                                                                                                                                           3065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The present sequence represents a new nucleic acid which encodes enzymes which participate in the biosynthesis of Omega-cyclohexane fatty acid. The nucleic acid is isolated from Alicyclobacillus acidocaldarius. The present invention also describes primers and probes containing all or part of the nucleic acid from Alicyclobacillus acidocaldarius. The primers and probes may be used for detection and/or identification of a microorganism of genus Alicyclobacillus. The method can detect and
                                                                                                                                                                       venezuelae desosamine biosynthetic gene cluster pikB,
                                                                                                                                                                                                                                                                                                                        3125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim
                                      WO200000620-A2
                                                               Streptomyces
                                                                                          hypercholesterolaemia;
                                                                                                                                             Desosamine biosynthesis; macrolide; polyketide; methymycin;
                                                                                                                                                                                                  05-JUN-2000
                                                                                                                                                                                                                             Z87284;
                                                                                                                                                                                                                                                    287284 standard; DNA; 12441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 7673 BP; 1288 A; 2432 C; 2762 G; 1191 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      New nucleic acid - useful for detection Alicyclobacillus microorganism(s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (KIRI ) KIRIN BEVERAGE KK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               28-FEB-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28-FEB-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    08-SEP-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JP10234376-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         identify Alicyclobacillus genus rapidly and easily.
                                                                                                                                                                                                                                                                                                                                                 162
                                                                                                                                                                                                                                                                                                                                                                                                     102
                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                    cggcgcgttgcaggccgggcgcatcgccgtgccgctttcggttccacaaaggcggc 216
                                                                                                                                                                                                                                                                                                                                                                          caagggggacaccgtcgcgctgcagctgccgaacgtgctcgactacgtcgtggccgtgtt
                                                                                                                                                                                                                                                                                                                                                                                         cacgggtgaccgcgtggtgatctctgctccgcagggactcgagtacgtcgtcgcctatct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1998-535030/46.
DB: W71633, W71634, W71635, W71636, W71637, W71638
                                                                                                                                                                                                                                                                                                                   65;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Page 9-18; 37pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                               venezuelae ATCC15439
                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               97JP-0046570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97JP-0046570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /label= ORF5
/function= "acyl-CoA dehydrogenase"
5812..6837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /function= "alcohol dehydrogenase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /label= ORF6
                                                                                                                                                                                                                                                                                                                                                                                                                                           3.9%;
                                                                                        crop
                                                                                                                                                                                                                                                                                                                                                                                                                            Score 35; DB : Pred. No. 1.2; 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                        protection
                                                                                                                                                                                                                                                     ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and identification of genus
                                                                                                                                                                                                                                                                                                                                                                                                                                                       19;
                                                                                                                                                                                                                                                                                                                                                                                                                                50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 7673;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 other
                                                                                                                                                                       SEQ
                                                                                                                                            pikromycin;
                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                   asthma,
                                                                                                                                                                       ID NO: 3.
                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                     161
                                                                                                                                                                                                                                                                                                                                                                           3124
                                                                                                                                                                                                                                                                                                                                                                                                                                0;
```

```
and/or macrolide biosynthetic gene clusters are useful for the production of biologically active macrolides. The macrolide biosynthetic proteins are useful for synthesis of methymycin, pikromycin, neomethymycin and narbomycin. The alternative termination of polyketide synthesis may be useful to prepare novel antibiotics and polyhydroxyalkanoate (PHA) monomers. The compounds produced by the recombinant host cells are useful as biopolymers, e.g., in packaging or biomedical applications, to engineer PHA monomer synthases or to prepare biologically active agents, engineer PHA monomer synthases or to prepare biologically active agents,
                                                                                                                                                     such as chemotherapeutics, immunosuppressants, agents to treat asthma, chronic obstructive pulmonary disease as well as other diseases involving respiratory inflammation, cholesterol-lowering agents or macrolide-based antibiotics which are active against a variety of organisms, e.g.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     comprising a desosamine biosynthetic gene cluster, a fragment biologically active variant, where the nucleic acid sequence derived from the eryC gene cluster of Saccharopolyspora erythem.
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                          pikromycin, neomethymycin, narbomycin or a combination of these compounds. Recombinant or augmented cells comprising the desosamine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         biosynthetic gene cluster, or fragments thereof. biosynthetic gene cluster encodes proteins which
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       derived from the eryC gene cluster of Saccharopolyspora erythraea or Streptomyces antibioticus. The invention also relates to a macrolide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The invention relates to an isolated and purified nucleic acid segment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Desosamine and macrolide biosynthetic gene clusters, synthesis of methymycin and pikromycin -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 2000-160679/14
P-PSDB; Y77179.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sherman DH,
                                            biosynthetic gene
                                                                   protection agents (e.g., fungicides or insecticides) via expression o
polyketides in plants. The present sequence represents the desosamine
                                                                                      respiratory pathogens, as well as viral parasitic pathogens, or as crop protection agents (e.g., fungicides or insecticides) via expression of
                                                                                                                                  bacteria, including multi-drug resistant pneumococci and other
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (MINU ) UNIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26-JUN-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           25-JUN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Page 281-287; 438pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Liu H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MINNESOTA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98US-0105537.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           99WO-US14398
                                            cluster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Xue
                                            from Streptomyces venezuelae ATCC 15439.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Zhao
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ε.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           synthesise
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The macrolide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    a fragment or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          uence is not 
erythraea o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         methymycin,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .
9
```

12441 ВP; 1704 A; 4294 Ç; 4686 G; 1757 T; 0 other

```
RESULT
287319
                                                                                                                                                                                                             Qy
XXXXII
                                                                                              밁
                                                                                                                 οy
                                                                                                                                           밁
                                                                                                                                                                δÃ
                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                      Matches 113;
                                  Z87319 standard;
                                                                                                        813 cagcggtagcgagcgggtacaggccgcgacgatcaagcgcttcgcc
                                                                                                                                          157
                                                                                                                                                                                                                 693
                                                                                                                                                                                                                                                   634 cccgcggtgctcaccagcccggtgtcgttcctgcagcgcccggcccggtggatgca-ctt 692
                                                                                              217
                                                                                                                                                                                         97
                                                                                                                                                                                                                                       37
                                                          9
                                                                                                                                                     acgaagaacaaccgacgacgacatggccgggcgtgacctcggcaacatactgaccatcct
                                                                                          ccgcggcatccactggatccacgccgcgaacggcgacccgtacgcc
                                                                                                                                          cgaagagatggcagaacccacggtgaccgacctgacgggggccctcacgcagcccc
                                                                                                                                                                                                             gatggccagcgattttcacgccttttcggcagcaccgaatttcgcctttgaactagcggc 752
                                                                                                                                                                                                                                      cccgcggcgcgccgatgcccgcgtcgtgcagcccccgaccagccttatcgaaggagcgg
                                                                                                                                                                                                                                                                                      Conservative
                                  DNA;
                                                                                                                                                                                                                                                                                                3.9%;
                                  13613
                                  ВP
                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                Score
Pred.
                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                34.8;
No. 1
                                                                                                                                                                                                                                                                                                              DB
                                                                                                                                                                                                                                                                                      112;
                                                                                                                                                                                                                                                                                                            21;
                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                           Length 12441;
                                                                                                                                                                                                                                                                                     <del>..</del>
                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                   812
                                                                                                                                                                                                                                       96
                                                                                                                                                                                         156
```

Z87319;

```
CDS
       Desosamine and macrolide biosynthetic gene clusters, synthesis of methymycin and pikromycin -
                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                               26-JUN-1998;
                                                                                                                                                                           06-JAN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Desosamine biosynthesis; macrolide; polyketide; methymycin; pikroneomethymycin; narbomycin; polyhydroxyalkanoate monomer synthase;
                                                                                                       (MINU ) UNIV
                                                                                                                                                     25-JUN-1999;
                                                                                                                                                                                                 WO200000620-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  hypercholesterolaemia; crop protection agent; ds.
                                       2000-160679/14.
DB; Y77204, Y77205,
Y77210, Y77211,
                                                                                  DH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            obstructive pulmonary disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            antibiotic; chemotherapeutic; immunosuppressant; ast
tructive pulmonary disease; respiratory inflammation;
                                                                                  Liu H,
                                                                                                          MINNESOTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             venezuelae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   desosamine biosynthetic gene cluster
                                                                                                                               98US-0105537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product= "PikB (
/transl_except= 
7492..8205
                                                                                                                                                                                                                                                                                                           /product= "PikB gene cluster complement (12342..13799)
                                                                                                                                                                                                                                                                                                                                                                                                                                                  /partial
/*tag= ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product= "PikB gene cl
complement (7942..8205)
                                                                                                                                                                                                                                                                           /product= "PikB gene cluster complement (13706..15043)
                                                                                                                                                                                                                                                                                                                                            /product= "PikB gene cluster complement (11271..12149)
                                                                                                                                                                                                                                                                                                                                                                              complement (10126..11139)
                                                                                                                                                                                                                                                                                                                                                                                       /product= "PikB gene cluster protein #6 (Y77208)"
/note= "No termination codon given in the specification"
/transl_except= (pos:8270..8272, aa:val)
/transl_except= (pos:8273..8275, aa:Thr)
/transl_except= (pos:8276..8278, aa:Gly)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product=
6834..7402
                                                                                                                                                                                                                      /product=
                                                                                                                                                                                                                                           /product= "P
15404..15574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product= "PikB gene cluster protein
/note= "No initiation codon given in
106..2014
                                                                                                                                                                                                                                                                    /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product= "PikB
2162..6741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         *tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          *tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 '∗tag=
                                                                                    Xue Y,
                                       Y77206,
Y77212,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATCC15439.
                                                                                                                                                                                                                      "PikB gene cluster
                                                                                                                                                                                                                                                      "PikB gene cluster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "PikB gene cluster
                                                                                    Zhao
                                       Y77207,
Y80998,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene cluster
(pos:6837..6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene cluster protein
                                                                                    ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cluster protein #5 (Y77207)
                                       Y77207, Y77208, Y77209
Y80999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ter protein #4 (Y77206)"
..6841, aa:Gln)
                                                                                                                                                                                                                       protein #11 (Y77212)'
                                                                                                                                                                                                                                                       protein #10 (Y77211)"
                                                                                                                                                                                                                                                                                         protein #9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protein
                                                                                                                                                                                                                                                                                                                         protein
                                                                                                                                                                                                                                                                                                                                                          protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pikB
                  useful for,
                                                                                                                                                                                                                                                                                                                         #8
                                                                                                                                                                                                                                                                                                                                                           #7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              #2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #1 (Y77204)"
the specification"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             #3 (Y77205)"
                                                                                                                                                                                                                                                                                          (Y77210)"
                                                                                                                                                                                                                                                                                                                           (Y77209)"
                                                                                                                                                                                                                                                                                                                                                          "(86608A)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             pikromycin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        asthma,
```

```
biosynthetic gene cluster, or fragments thereof. The macrolide biosynthetic gene cluster encodes proteins which synthesise methymycin, pikromycin, neomethymycin, narbomycin or a combination of these compounds. Recombinant or augmented cells comprising the desosamine and/or macrolide biosynthetic gene clusters are useful for the production of biologically active macrolides. The macrolide biosynthetic proteins are useful for synthesis of methymycin, pikromycin, neomethymycin and narbomycin. The alternative termination of polyketide synthesis may be useful to prepare novel antibiotics and polyketide synthesis may be useful to prepare novel antibiotics and polyketide synthesis cells are useful as biopolymers, e.g., in packaging or biomedical applications, to engineer PHA monomers synthases or to prepare biologically active agents, each as characteristics and polyketide synthesis may be as characteristics.
                                                                                                                                                                                                                                                                                                                                                                        such as chemotherapeutics, immunosuppressants, agents to treat asthma, chronic obstructive pulmonary disease as well as other diseases involving respiratory inflammation, cholesterol-lowering agents or macrolide-based antibiotics which are active against a variety of organisms, e.g.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The invention relates to an isolated and purified nucleic acid segment comprising a desosamine biosynthetic gene cluster, a fragment or its biologically active variant, where the nucleic acid sequence is not derived from the eryC gene cluster of Saccharopolyspora erythraea or Streptomyces antibioticus. The invention also relates to a macrolide
                                                                                                                                                                                                                                 bacteria, including multi-drug resistant pneumococci and oth respiratory pathogens, as well as viral parasitic pathogens, protection agents (e.g., fungicides or insecticides) via exp
                                                                                     biosynthetic gene cluster (pik) from 15439, as given in figure 32.
                                                                                               profection agents (e.g., fungicides or insecutive, the desosamine polyketides in plants. The present sequence represents the desosamine polyketides in plants. The present sequence venezuelae ATCC
Sequence 13613 BP; 1858 A; 4733 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Disclosure; Figure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         438pp; English
5092
<u>ი</u>
     1930
T; 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nucleic acid segment
                                                                                                                                                                                                                                                                                                                                and other
     other;
                                                                                                                                                                                                                                                                                        or as crop
```

```
Matches
                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                813 cagcggtagcgggtaccaggccgcgaccgatcaagcgcttcgcc 858
   904
                                                               844
                                                                                                                                                           693
                                                                                                                                                                                          724
                                                                                             753
                                                                                                                            784
                                                                                                                                                                                                       cccgcggtgctcaccagcccggtgtcgttcctgcagcgcccggcccggtggatgca-ctt 692
                                                                            acgaagaacaaccgacgacgaccatggccgggcgtgacctcggcaacatactgaccatcct 812
                                                                                                                                              gatggccagcgattttcacgccttttcagcagcaaccgaatttcgcctttgaactwycggc
ccgcggcatccactggatccacgccgcgaacggcgacccgtacgcc
                                                                                                                                                                                        cccgcggcgcgcccgatgcccgctcgtgcagcccccgaccagccttatcgaaggagcgg 783
                                                              cgaagagatggcagaacccacggtgaccgacgacctgacgggggccctcacgcagcccc
                                                                                                                                                                                                                                                      113;
                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                    3.9%;
                                                                                                                                                                                                                                                   Score 34.8; Di
Pred. No. 1.8;
0; Mismatches
                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                  DΒ
                                                                                                                                                                                                                                                     112;
                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                 Length 13613;
   949
                                                                                                                                                                                                                                                   <u>,,</u>
                                                                                                                                                                                                                                                     Gaps
                                                               903
                                                                                                                            843
```

QΥ

뭥 QУ В Ş

В Qy В

```
RESULT 10
                            27-MAR-1991
                                      Q10190
                                      standard; DNA;
                            (first entry)
                                      ВP
```

Cephalosporin antibiotic biosynthetic genes

cephalosporin; antibiotic; S-(L-alpha-aminoadipyl)-L-cysteinyl-D-; valine synthetase; isopenicillin N synthetase; isopenicillin N epimerase; deacetoxycephalosporin C synthetase; beta-lactamase; deacetoxycephalosporin C hydroxylase; ss. Lysobacter lactamgenus

```
Query Match
Best Local Similarity
Thes 72; Conserv
                                                                                                          888888888
Š
              ₽
                           δÃ
                                           В
                                                        QУ
                                                                                                                                                                                33
                                                                                                                                                                                                                                                                                                                                                                                                        13356
                                            13296
                                                                                                                    A fragment of the sequence comprising at least one of the cephalosporin biosynthetic enzymes listed in the KEYWORDS can lead to transform microbes, such as bacteria or yeast. Although DNA is preferably isolated from Lactamgenus, similar sequences could be obtained from other bacteria containing genes coding for biosynthesis of cephalosposeries antibiotics. See also Q10191-2.
                                                                                                                                                                             Claim 4; Fig 1; 67pp; Japanese
                                                                                                                                                                                                 Prepn. of cephalosporin series antibiotics - comprises culturing transformant of microbe transformed by plasmid contg. new DNA
                                                                                                                                                                                                                        WPI; 1991-018854/03.
P-PSDB; R10145,R10688-R10695
                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                            01-FEB-1989;
10-JAN-1990;
                                                                                                                                                                                                                                                                                               03-DEC-1990
                                                                                                                                                                                                                                                                                                              JP02291274-A
                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                         Sequence
                                                                                                                                                                                                                                              (TAKE ) TAKEDA CHEMICAL IND KK
                                                                                                                                                                                                                                                                                 10-JAN-1990;
                             477
                                                         417
 537
              ccgcaacgtgctgagcttcagcgccggcctggcccagcgctacttcggcgacgccggcgc 13415
gattccaccgccaa 550
                                         cgcttacgcgatctacacctccggcaccaccgggcggcccaaggccgtgctggtccgcca
                                                 cgcgtatttgcaatacacctccgggtccacccgcacgccgctggcgtggtgatgtccca 476
                     tcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacgg 536
                                                                                                         23666 BP;
                                                                      Conservative
                                                                                                                                                                                                                                                           89JP-0024710.
90JP-0003762.
                                                                                                                                                                                                                                                                                 90JP-0003762
                                                                                                                                                                                                                                                                                                                                                             /*tag= g
/label= ORF
2887..4200
                                                                                                                                                                                                                                                                                                                                                                                 /label= ORF
4211..5443
                                                                                                                                                                                                                                                                                                                                        /label= ORF
6..2819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers 5524..16692
                                                                                                                                                                                                                                                                                                                            /label=
                                                                                                                                                                                                                                                                                                                                                                                                        21186..22343
                                                                                                                                                                                                                                                                                                                                                                                                /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                /label= ORF
18798..19739
                                                                                                                                                                                                                                                                                                                                                       *tag=
                                                                                                                                                                                                                                                                                                                                                                                                                     *tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                  /*tag= d
/label= ORF
                                                                                                                                                                                                                                                                                                                                                                                                              *tag= e
label= ORF
                                                                                                                                                                                                                                                                                                                                                                                                                             9802..21061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7802..18761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .abel=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 abel= ORF 1
                                                                                                        3952 A; 8522 C; 7603
                                                                            3.9%;
                                                                                                                                                                                                                                                                                                                            ORF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORF 2
                                                                     Score 34.8; DB Pred. No. 2.2; 0; Mismatches
                                                                      0;
                                                                                                         G;
                                                                                    DB 12;
                                                                                                         3589
                                                                      62;
                                                                                                         T;
                                                                                   Length 23666;
                                                                      Indels
                                                                                                         0 other;
                                                                                                                              cephalosporin
                                                                      0;
                                                                                                                                                         bе
                                                                     Gaps
                                         13355
                                                                      0,
밁
```

```
RESULT
256001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             13416 ggcgcggcaggcga 13429
                                                                                                                                          28-MAY-1998;
28-AUG-1998;
22-SEP-1998;
08-FEB-1999;
                                         WPI; 200
P-PSDB;
New recombinant DNA encoding a domain of narbonolide polyketide synthase, for production of ketolide antibiotics -
                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                   Ashley G,
                                                                                                                                                                                                                27-MAY-1999;
                                                                                                                                                                                                                                            02-DEC-1999.
                                                                                                                                                                                                                                                                      W09961599-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Streptomyces venezuelae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 antibiotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Narbonolide polyketide synthase; PKS; cosmid pKOS023-27; ketolide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Recombinant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               256001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Z56001 standard;
                                                                                                               (KOSA-) KOSAN BIOSCIENCES INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       11
                                       2000-072618/06.
)B; Y67201, Y67202, Y67203,
                                                                                   Betlach MC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              production; narbomycin; picromycin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                          98US-0087080.
98US-0141908.
98US-0100880.
99US-0119139.
                                                                                                                                                                                                                99WO-US11814
                                                                                                                                                                                                                                                                                                                                         /note= "Desosaminyl
37529..38242
                                                                                                                                                                                                                                                                                                                                                                                               /product= PICCII
/note= "4-keto-6-deoxyglucose
36159.37439
                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note= "Contains 34863..36011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product= PICAIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product= PICAIII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product= PICAII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA;
                                                                                                                                                                                                                                                                                                              /product= PICCVI
                                                                                                                                                                                                                                                                                                                             /*tag=
                                                                                                                                                                                                                                                                                                                                                                      /product= PICCIII
                                                                                                                                                                                                                                                                                                                                                                                   /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                           /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product= PicB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   *tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                33961..34806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      29924..33964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'note= "Narbonolide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note≃ "Narbonolide
25133..29821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13830..25049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                note= "Narbonolide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product= PICAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               note= "Narbonolide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pKOS023-27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           38506
                                                                                                                                                                                                                                                                                                 "3-amino dimethyltransferase"
                                                                                   Betlach
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ΒP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        containing S. venezuelae PKS genes.
                                                                                   ĭ
                                         Y67204, Y67205, Y67207, Y67208, Y67211.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       typeII
                                                                                   McDaniel
                                                                                                                                                                                                                                                                                                                                                       transferase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            synthase subunit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     synthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           synthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  synthase subunit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     thioesterase domain"
                                                                                   æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    subunit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           subunit
                                                                                                                                                                                                                                                                                                                                                                                                              isomerase
                                                                                  Tang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ω
```

```
γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           888888888888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   34901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            34841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     subsequent modifications. Modular PKSS are responsible for the production of many antibiotics including picromycin. The narbonolide PKS consists of a loading module, six extender modules, and two thioester domains. Pour proteins make up the narbonolide PKS (PICAI, PICAII, PICAIII and PICAIV). PICAI includes the loading module and extender modules 1 and 2, PICAII includes extender modules 3 and 4, PICAIII includes extender module 5 and PICAIV includes extender module 6 and a type II thioesterase domain. The second type II thioesterase domain is found on the PICB protein. The nucleotide sequences encoding all of these proteins can be isolated in recombinant form from the recombinant cosmid pKOS023-27. Narbonolide is desosaminylated in S. venezuelae to yield narbomycin, the desosaminylated the Acceptance of the PICA protein and                                                                                                                                                                                                                                                                                                                         S. cellulosum DNA encoding polyketide and
                                                                                                                                                                                                                                                                                                                                                                                 07-AUG-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                       A11992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              transferase enzyme is required for this conversion, and the desosamine biosynthetic genes are also found in cosmid pKOS023-27. The recombinant DNA of the invention is used to express, in transformed cells,
                                                                                                                                                                                                               plant-protection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A11992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            narbonolide (or its derivatives) or other ketolides (particularly hybrids), which may then be converted (e.g. by other enzymes recombinantly expressed in the same hosts) to polyketide antibiotics
                                                                                                                                                            Sorangium
                                                                                                                                                                                                                                              epothilone;
                                                                                                                                                                                                                                                                  Polyketide biosynthesis; heteropolyketide biosynthesis; mutasynthesis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 38506 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               synthase (PKS). The invention relates to recombinant DNA containing a coding sequence for a narbonolide PKS. Polyketides are compounds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Streptomyces venezuelae DNA insert. The cosmid contains open reading frames which encode the various modules of the narbonolide polyketide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Example
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           their intermediates. The antibiotics are useful in human or veterinary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        synthesised from 2-carbon units through a series of condensations and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cagcggtagcgagcggtacaggccgcgacgatcaagcgcttcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acgaagaacaaccgacgacgacatggccgggcgtgacctcggcaacatactgaccatcct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgaagagatggcagaacccacggtgaccgacctgacgggggccctcacgcagccccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cccgcggtgctcaccagcccggtgtcgttcctgcagcgcccggcccggtggatgca-ctt 692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ccgcggcatccactggatccacgccgcgaacggcgacccgtacgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gatggccagcgattttcacgccttttcggcagcaccgaatttcgcctttgaactagcggc 752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cccgcggcgccccgatgcccgcgtcgtgcagcccccgaccagccttatcgaaggagcgg 34780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2;
                                                                                                                                                            cellulosum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Page
                                                                                                                                                                                                                                            cytotoxic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                 (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16-27; 98pp; English
                                                                    Location/Qualifiers complement (3398..6100)
                   /product= "ORF1-tRNA synthetase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4914 A; 15118 C; 13444 G;
                                                                                                                                                                                                                                                                                                                                                                                 entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             37856
                                                                                                                                                                                                                                            immunosuppressant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cosmid pKOS023-27 DNA sequence which contains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 34.8;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6
                                                                                                                                                                                                                                                                                                                        hereropolyketide enzymes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ВВ
                                                                                                                                                                                                                                            antibiotic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 38506;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   34946
                                                                                                                                                                                                                                            antifungal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            34900
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 or.
```

```
FFFFFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       F F F
                                                                                                                                                                                                                                                                                                                                                                                                                                               # # # #
# # # #
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FFFFF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                33
      This invention describes a novel DNA sequence (1) whose expression products effect or are involved in the enzymatic blosynthesis, mutasynthesis or partial synthesis of polyketide or heteropolyketide compounds (II). (I) can be inserted into an expression vector and used to transform or transfect prokaryotic or eukaryotic cells with the aim of obtaining strains that produce large amounts of polyketide or
                                                                                           Claim
                                                                                                               DNA sequence coding for products involved in the biosynthesis of polyketide or heteropolyketide compounds, especially epothilone
                                                                                                                                                                                                                                                                                                                                                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                         09-OCT-1998;
                                                                                                                                                                                                                                                                      13-APR-2000
                                                                                                                                                                                                                                                                                            DE19846493-A1
                                                                                                                                                                                                 (GBFB
                                                                                                                                                    2000-294101/26
                                                                                                                                                                           ģ
                                                                                                                                                                                               ) GES BIOTECHNOLOGISCHE
                                                                                         Page 20-33; 36pp; German.
                                                                                                                                                                           Mueller
                                                                                                                                                                                                                         98DE-1046493
                                                                                                                                                                                                                                               98DE-1046493
                                                                                                                                                                                                                                                                                                                                                  /product= "ORF13-transcription complement (35730..36242)
                                                                                                                                                                                                                                                                                                                                                                                    /product= "ORF12-regulation complement (35255..35616)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product "ORF10-transcription regulator"
33128..33613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product= "ORF8-transpeptidase"
complement (30040..31720)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product= "ORF2-monooxygenase"
complement (8433..9550)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "gtg start codon" complement (6374..7111)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      31982..32932
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9855..11393
                                                                                                                                                                                                                                                                                                                                                                        /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                 /product= "ORF11-regulation
/note= "GTG start codon"
                                                                                                                                                                                                                                                                                                                  /product= "ORF14-transcription regulator"
/note= "GTG start codon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product= "ORF3-aminotransferase"
/note= "AGT start codon given in
                                                                                                                                                                                                                                                                                                                                                                                                           /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                        3661..34077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 note= "CGC stop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       28251..29400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /rtag= g
/product= "ORF7-peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20003..27889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  'product= "ORF6-polyketide synthase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product= "ORF5-3-oxoacyl-ACP-reductase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product= "ORF4- tyrosine/DOPA-Decarboxylase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5374...19984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      note= "ACC start codon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ...13658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "GTG
                                                                                                                                                                                                                                                                                                                                                                         3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "ORF9-regulation GC stop codon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 start
                                                                                                                                                                                                  FORSCHUNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   codon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                synthetase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              element'
                                                                                                                                                                                                                                                                                                                                                                                                element"
                                                                                                                                                                                                                                                                                                                                                                                                                                             element"
                                                                                                                                                                                                                                                                                                                                                              regulator"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              specification"
```

compounds,

especially

epothilones,

have cytotoxic

```
8 x 22 22 22 x x
δÕ
                                        DЬ
                                                                           Qy
                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACC XXX ACC XX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     33333X3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KESULT 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 66
                                                                                                                                                                                                        Query Match
Best Local Similarity
Matches 67; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21623 atcgagacggtcgtggcgatcctcggcgtgctcaaggctggcggggcctacgtgccgct 21681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21563
                                                                                                                                                                                                                                                                                                                                                                       The sequence given is a cytidine triphosphate (CTP) synthase gene which has been modified such that it is not inhibited by cytidine This allows accumulation of cytidine in the culture. This method
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         and/or immunosuppressant and antibiotic and antifungal activities and are useful as plant-protection agents. This sequence represents the DNA sequence isolated from Sorangium cellulosum which is described in the method of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fermentative prepn. of cytidine - using microorganism expressing cytidine tri:phosphate synthase for increased productivity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Cytidine triphosphate;
                                                                                                                                                                                                                                                                                                               Sequence 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Disclosure; Fig la; 7pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 1992-223969/27.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 17-OCT-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17-OCT-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                26-MAY-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JP04152891-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacillus natto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTP synthase gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14-DEC-1992 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q25783 standard; DNA; 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 37856 BP; 5655 A; 13666 C; 12913 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (ASAH ) ASAHI CHEM IND CO LTD
                                                                                                                                                                                                                                                                                                                                                      far more productive than previous methods.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               139 ctcgagtacgtcgtcgcctatctcggcgcgttgcaggccggggcgcatcgccgtgccgct 197
                                                                               820
  880 ct 881
                                      121 GTCGATCTCTTCAAACTCGTCAAGATCAAGATCTTCTTCGACTGCTTTCTTCGCTTTTTT
                                                                                                                          181
                                                                                                                                              760 acaaccgacgacgacatggccgggcgtgacctcggcaacatactgaccatcctcagcggt 819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity 55.5 hes 66; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         79
                                                              agcgagcgggtacaggccgaccgatcaagcgcttcgccgaccgctttgctcgcttcaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     caggagctgagccgttgtggttccacgggtgaccgcgtggtgatctctgctccgcaggga 138
                                                                                                                        AAAATCGTCGGCTTCAAGATCGAGTTCTTCCTCAACTTCATCCAAATCAAGGTCGTCTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cacctgcggagcctgggcgtgggcccagaggtgcgcgtcgggttgtatctcgaacggtca 21622
                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                               BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              90JP-0276489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       90JP-0276489
                                                                                                                                                                                                                                                                                                             642 A; 406 C; 477 G; 475 T; 0 other;
                                                                                                                                                                                                                         3.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           inhibit;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ΒP
                                                                                                                                                                                                        Score 34; DB 1
Pred. No. 1.5;
0; Mismatches
                                                                                                                                                                                                        0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 34.2; DI
Pred. No. 4;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SS.
                                                                                                                                                                                                                                                 DB 13; Length 2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DВ
                                                                                                                                                                                                        55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5622 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21;
                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 37856;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                        0;
                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                        62
                                                                               879
                                                                                                                        122
                                                                                                                                                                                                                                                                                                                                                                            j.
                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOXCOXXXIII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
DEXECT
                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                               밁
```

```
RESULT 1
Q14668/c
                                                                                RESULT 15
A02477
                                                                                                                                                                                                                                                                                                                                                Query Match 3.8
Best Local Similarity 54.9
Matches 67; Conservative
 19-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTP synthetase
                                                                  A02477 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 3001 BP; 968 A; 601 C; 704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Microorganisms transformed with the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Disclosure; Fig 2; 8pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Prodn. of cytidine by fermentation with increased yield - comprises transforming a suitable microorganism with a recombinant DNA contg. CTP synthetase gene and incubating with a uracil cpd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WPI; 1991-343171/47.
P-PSDB; R15642.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               05-FEB-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                05-FEB-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  09-OCT-1991.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacillus natto C-1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cytidine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                05-FEB-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q14668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q14668 standard; DNA; 3001
                                                                                                                                                                                                                                                                                                                                                                                                                                                            cytidine for use as a starting cpd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JP03228689-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (ASAH ) ASAHI CHEMICAL IND KK
                                                                                                                                                                     880 ct 881
                                                                                                                                                                                                                                   820 agcgagcgggtacaggccgcgaccgattcgccgaccgctttgctcgcttcaat 879
                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                  760 acaaccgacgacatggccgggcgtgacctcggcaacatactgaccatcctcagcggt 819
                                                                                                                                                                                                                  121 GTCGATCTCTTCAAACTCGTCAAGATCAAGATCTTCTTCGACTGCTTTCTTCGCCTTTTTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14
                                                                                                                                                  CT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ဌ=
                                                                                                                                                                                                                                                                                   AAAATCGTCGGCTTCAAGATCGAGTTCTTCCTCAACTTCATCCAAATCAAGGTCGTCTTC 122
                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SS
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90JP-0025574.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                90JP-0025574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers 513..2119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /*tag=
                                                                  CDNA;
                                                                                                                                                                                                                                                                                                                                                              3.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ВP
                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                Score 34; DB 1
Pred. No. 1.7;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                 G; 728 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene can be used to for prodn. of drugs.
                                                                                                                                                                                                                                                                                                                                                                                 12;
                                                                                                                                                                                                                                                                                                                                                  55; Indels
                                                                                                                                                                                                                                                                                                                                                                               Length 3001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             produce
                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                Gaps
```

0;

Human colon cancer cell line polynucleotide sequence SEQ ID NO:2468.

```
Query Match
Best Local S
Matches 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14-MAY-1998;
15-MAY-1998;
15-MAY-1998;
21-OCT-1998;
27-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The polynucleotides sequences can be used in a method for detecting differentially expressed genes correlated with a cancerous state of a mammalian cell. The polynucleotides can also be used as probes for detecting and mapping related genes. They can be used in diagnosis and prognosis of diseases and disorders (e.g. identification of pre-metastatic or metastatic cancerous states, stages of cancer, or responsiveness of cancer to therapy). This is particularly for breast cancer, oestrogen receptor-positive breast cancer, oestrogen receptor-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     correlated with a cancerous state of a mammalian cell, comprising detecting at least one differentially expressed gene product in a test sample derived from a cell suspected of being cancerous, where detection of the differentially expressed gene product is correlated with a cancerous state of the cell from which the test sample was derived.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A00010 to A02716 represent polynucleotides isolated from cDNA libraries constructed from human colon cancer cell lines. The present invention also describes a method of detecting differentially expressed genes correlated with a cancerous state of a mammalian cell, comprising
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Williams LT, Escobedo J, Innis MA, Garcia PD, Sudduth-Klinger J; Reinhard C, Giese K, Randazzo F, Kennedy GC, Pot D, Kassam A; Lamson G, Drmanac R, Crkvenjakov R, Dickson M, Drmanac S, Labat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Human; colon cancer; tumour; diagnosis; gene expression product; probe; detection; cancerous state; metastasis; identification; breast cancer; oestrogen receptor-positive breast cancer; therapy; oestrogen receptor-negative breast cancer; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 1127 BP; 3 A; 214 C; 505 G; 49 T; 356 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 1; Page 990; 1097pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Polynucleotide library used to determine cells -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 2000-126369/11.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (CHIR ) CHIRON CORP. (HYSE-) HYSEQ INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Leshkowitz D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18-NOV-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO9958675-A2
                                                      865 cngcngnggggggcncccncngggntggnggggggttgggcgggncnnnccccggncncg 924
                                                                                                                                                                                                                                                                                                              745
197 tttcggttccacaaggcggc 216
                                                                                                                                                                                                                                                    77
                                                                                                                                                                                                                                                                                                                                                                           17
                                                                                                gactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggggcgcatcgccgttgcaggccggggcgcatcgccgttgcaggccggggcgcatcgccgttgcaggccggggcgcatcgccgc 196
                                                                                                                                                                                                                       cacaggagctgagccgttgtggttccacgggtgaccgcgtggtgatctctgctccgcagg 136
                                                                                                                                                                                                                                                                                                                                                  gggacggcgttgcgataaccctgacgcggtcgcagctgtatcggcgaacgctgaatgtgg 76
                                                                                                                                                                                                                                                                                                              ggggncnngnngngggcgcncgnggggggacnggncnggcgnggcgggngcngggnncng 804
                                                                                                                                                                                    cacngnggnggncnggggggggccnngnggggnggccgtgggccnctncgggngccnng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       breast cancer, lung cancer,
                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98US-0085426.
98US-0085537.
98US-0085696.
98US-0105234.
98US-0105877.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Kita D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99WO-US10602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Garcia V, Jones LW,
                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 32.8;
Pred. No. 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             and colon cancer.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cancerous states of mammalian
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                         124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GC, Pot D, Kassam on M, Drmanac S, 1 Stache-Crain B;
                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 1127;
                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Labat I;
                                                                                                                                                                                       864
                                                                                                                                                                                                                                                                                                                                                                                                                                         0
```

Ş

Дb δÃ 8 × 6 6

8 В

٠ ٥ В

> В 925 ncnnngncgccgccgnnggc

Search completed: January 12, 2001, 20:07:53 Job time: 26357 sec

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          btal number of hits satisfying chosen parameters:
  January 12, 2001, 20:03:20; Search time 6876.06 Seconds (without alignments) 672.090 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GenEmbl:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-461-774-5
903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1118133 seqs, 2558875100 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 gattacgaacaggactggga.....aggagagggtgaaagcttaa 903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gb_pr2:*
gb_pr3:*
gb_pr3:*
gb_sy:*
gb_un:*
em_fun:*
em_hum1:*
em_hum2:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gb_ba1:*
gb_ba2:*
gb_om:*
gb_ov:*
gb_ph:*
gb_pl1:*
gb_pl2:*
gb_pr1:*
em_om:*
em_ov:*
em_ov:*
em_pat:*
em_ph:*
em_ph:*
em_pl:*
em_ro:*
em_vi:*
em_un:*
em_un
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2236266
```

	7754 : : : : : : : : : : : : : : : : : : :		
9b_pr7: * 9b_pr7: * 9b_sts1: * 9b_sts2: * 9b_pat2: * 9b_pat2: * em_ht90: * 9b_ht924: * 9b_pr8: *	m_htgb_ntgb_ntgb_ntgb_ntgb_ntgb_ntgb_ntgb_n	_htg11: _htg12: _htg14: _htg14: _in3:* _in3:* _htg15: _htg17: _htg17: _htg17: _htg6::**	m_htg2 m_htg3 m_hum5 lb_p13: lb_pr5: lb_htg8 lb_htg9

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

c 21	c 19	c 18	17	16	c 15	14	13	12	c 11	c 10	9	c 8	7	6	ი 5	4	c 3	2	<u></u>	Result
86.6	117.8	124	185	185	291	313.4	317.2	317.2	320.2	367.4	371.8	385	385	400	426.2	426.2	870.2	888.6	891.8	Score
9.6	13.0	13.7	20.5	20.5	32.2	34.7	35.1	35.1	35.5	40.7	41.2	42.6	42.6	44.3	47.2	47.2	96.4	98.4	98.8	Query
22444	357	23740	42741	22570	34316	29372	31176	31175	43523	37840	41171	37316	11430	11042	41321	30352	9699	1749	24292	Query Match Length
1 7	3 10	2	Ν	2	N	2	N	2	2	2	73	2	2	N	N	N	2	N	۵	BB
AE004669	AF288926S1	MTV026	MSGY423	MTCY4D9	MLCB12	MTCY338	MSGY2	MTU00024	MTCY349	MTV005	U00010	MSGY456	MTCY19G5	MTV045	MSGY 4 09	MTCY409	MSGMYACSYN	MBU75685	MTCY24G1	ID
AE004669 Pseudomon	AF288926 Mycobacte	AL022076 Mycobacte	AD000014 Mycobacte	Z84725 Mycobacteri	AL035480 Mycobacte	Z74697 Mycobacteri	AD000009 Mycobacte	U00024 Mycobacteri	Z83018 Mycobacteri	AL010186 Mycobacte	U00010 Mycobacteri	AD000001 Mycobacte	Z77826 Mycobacteri	AL022000 Mycobacte	AD000017 Mycobacte	Z97188 Mycobacteri	M95808 Mycobacteri	U75685 Mycobacteri	z83858 Mycobacteri	Description

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
MTCY24G1
                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           00
                                                                                                                                                                                                                                                                                                                                              JOURNAL
MEDLINE
                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                            REMARK
                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             399
                                                                                                                               Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetiqu Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:1781164.
                                                                                                                                                                                                                                                                                                                                                                                                                                    Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C. E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Barrell,B.G.
Deciphering the biology of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MTCY24G1 24292 bp DNA
Mycobacterium tuberculosis
283858 AL123456
283858.1 GI:3261675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                          available on the World Wide Web.
                                                                                             Details of M.
                                                                                                                                                                                                                                                Direct Submission
                                                                                                                                                                                                                                                                                                       Erratum:[[published erratum appears in 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                98295987
                                                                                                                                                                                                                                                                                                                                                                complete genome sequence Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 24292)
                                                                                                                                                                                                                                                                                       (bases
 prediction was based on a Hidden
                 renumbered from the original cosmid submissions designations are in brackets after the new gene
                                   http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have renumbered from the original cosmid submissions but the old
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 to 24292)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   340
9435
9435
9435
14100
462
38721
391721
391723
3522
37036
27036
26440
30001
30001
30001
30001
30001
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
31039
                                                                                           tuberculosis sequencing at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MTCY02B10
MSGY151
AF082993
SCE15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MTCY251
AF237701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MTCY9F9
AF210249
MTU64610
AX024284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AF076477
AE004663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MSGY219
MTCY10H4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MXU24657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AX024391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AE004667
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AR031772
I32939
                                                                                                                                                                                       Submitted on behalf of the Mycobacterium and mapping teams, Sanger Centre, Wellcome nxton, Cambridge CB10 1SA Unite de Genetique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H37Rv complete genome;
Markov Model of TB genes
                                                                                                                                                                                                                                                                                                                            Nature 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BCT
                                                                                                                                                                                                                                                                                                                                                                                                     tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AF082993 Cryptospo
AL049707 Streptomy
AR031772 Sequence
132939 Sequence 1
AF076477 Burkholde
AE004663 Pseudomon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AX024284 Sequence
AX024391 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            U24657 Myxococcus
AF288927 Mycobact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                U64610 Mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AE004666 Pseudomon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AE002011 Deinococc
AE004667 Pseudomon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AD000018 Mycobacte
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AD000013 Mycobacte
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             segment 130/162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17-JUN-1998
                                                                                                                                                                                                                                                                                                                              Nov
                     numbers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pseudomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mycobacteri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pseudomon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacte
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Streptomy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Trypanoso
```

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct CAUTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CAUTION: In some initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PQAVITWONNERS TO THE PROPERTY OF THE PART ALEAS PESSENGIA EVER PARASTA PARASTA PESSENGIA EVER PARASTA PARASTA PER PARASTA PARASTA PARASTA PESSENGIA EVER PARASTA PARASTA PESSENGIA EVER PARASTA PARASTA PARASTA PESSENGIA EVER PARASTA PA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(77.
/gene="mas"
complement(77.
/gene="mas"
                                                                                                                                                                  VTRQAQIVKPHDSGERANLEQAGLIGLLRVISSEHPMLRTTLIDVDEHTDVERVAQQL
LSGSEEDETAWRNGDWYVARLIPSPLGHEERRTAVLDPDHDGWRYQVBRPGDLQTLEF
VASDRVPGGPGQIEVAVSMSSINFADVLIAFGRFPILDDEQALTVATAHYAWGEG
VTGHQVGDRVGGFSEGGCWRTFLTCDANLAVTLPPGLITDEQAITAATTHATAWYGLND
LAQIKAGDKVLIHSATGGVGQAAISIARAKGAEIFATAGNPAKRAMLRDMGVEHVYDS
RSVEFABQIRBDTDGYGVDIVLNSLTGAAQRAGLELLAFGGRFVEIGKADVYGNTRLG
LFPFRRGLTFYYLDLALMSVTQPDRVRELLAFTKDGSVIITGGLGSLGLFFASAL
RAMSNAEHTGKLVLDVPRSGRRSVAVTPEQAPLYRRDGSVIITGGLGSLGLFFASKL
AAAGCGRIVLTARSQPNPKARQTIEGLRAAGADIVYECGNIAEPDTADRLVSAATATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="Rv2940c, (MTCY24G1.09-MTCY19H9.08c), len: 2111, /note="Rv2940c, (MTCY24G1.09-MTCY19H9.08c), len: 2111, Mycocerosic acid synthase, almost identical to M. bovis Mycocerosic acid synthase (2110 aa), MCAS_MYCBO (02251 Mycocerosic acid synthase (2110 aa), fasta scores, opt: 12812, E(): 0, (95.7% identity in 2046 aa overlap), highly similar to G466793 MASA, (2118 aa) opt: 8211, E():0, (61.0% identity in 2064 aa overlap);
LPLRGVLHSAAVVEDÄTLTNITDELIDRDWSPKVFGSWNLHRATLGQPLDWFCLFSSG
AALLGSPGQGAYAAANSWVDVFAHWRRAQGLPVSAIAWGAWGEVGRATFLAEGGEIMI
TPEEGAYAFETLVRHDRAYSGYIPILGAPWLADLVRRSPWGEMFASTGQRSRGPSKFR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QGMLSSTGRCHSFDADADGFVRSEGCAMVLLKRLPDALRDGNRIFAVVRGTATNQDGR
TETLTMPSEDAQVAVYRAALAAAGVQPETVGVVEAHGTGTPIGDPIEYRSLARVYGAG
TPCALGSAKSNMGHSTASAGTVGLIKAILSLRHGVVPPLLHFNRLPDELSDVETGLFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="mas"
/protein_id="CAB06108.1"
/db_xref="GI:3261676"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MESRVTPVAVIGMGCRLPGGINSPDKLWESLLRGDDLVTEIPPD
RWDADDYYDPEPGVPGRSVSRWGGFLDDVAGFDAEFFGISEREATSIDPQQRLLLETS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PS00606 Beta-ketoacyl synthases active site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref="taxon:1773"
/clone="Y19H9"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AHTLGLHGPAMTFDTACSSGLMAVHLACRSLHDGEADLALAGGCAVLLEPHASVAASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WEATEHAGLDPASLAGSSTAVFTGLTHEDYLVLTTTAGGLASPYVVTGLNNSVASGRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref="SPTREMBL:P96291"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Mycobacterium
/strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .24292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .6412)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tuberculosis'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tuberculosis"
```

```
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             misc_feature
                                                       /transl_table=11
/protair="mmpt7"
/protair="mmpt7"
/protair_id="CAB06107.1"
/protair_id="CAB06107.1"
/db_xref="G1:1781171"
/db_xref="G1:1781171"
/db_xref="G1:1781171"
/db_xref="SPTREMBL:P95289"
/translation="mpsPagRLHRIRYIRLKKSSPDCRATITSGSADGQRRSPRITNL
/translation="mpsPagRLHRIRYIRLKKSSPDCRATITSGSADGQRRSPRITNL
/translation="mpsPagRLHRIRYIRLKKSSPDCRATITSGSADGQRRSPRITNL
/translation="mpsPagRLHRIRYIRKKSSPDCRATITSGSADGRRSATA
YLVVEGGSTLEPQDQPYYDAAVGALRADTRHVGSVLDWWSDPVTAPLGTSPDGRSATA
MVWLHGEAGTTQAASLDAVRSVLRQLDPSEGLRASIVVPAITNDMMQTISWQSATI
VTVAAVIAVLLLLRARLSVRAAAIVLLTABLSLAVAMPLAAVRGHDWGTDSVESWTL
AAVLTIGTITAATMLAARLSVRAAAIVLLTABLSLAVAMPLAAVRGHDWGTDSVESWTL
AAVLTIGTITAATMLAARSLTVLPALTALAGASRQLPAPTGAGWTGRLSLPVSSASA
ALHGVGTAGLGVFVALAASSLTVLPALTAGAGARQLPAPTTGAGWTGRLSLPVSSASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="fadD28"
/note="PS00018
8767. 11529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/gene="mmpL7"
/g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7032. .8774
/gene="fadD28"
/note="Rv2941,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Rv2941, (MTCY24G1.08c), len: 580 aa,fadD28, probable Acyl-CoA Synthetase, similar to many e.g. Y05_MYCTU Q10976 hypothetical 67.9 kd protein cy338.19 (626 aa), fasta scores, opt: 2337, E(): 0, (57.7% identity in 619 aa overlap), also MTCY19G5.07, (64% identity in 584 aa overlap), also near identical to YMAZ_MYCBO Q02278 hypothetical 32.3 kd protein in mas 5 (298 aa), fasta scores, opt: 1884, E(): 0, (99.0% identity in 288 aa overlap); contains PS00018 EF-handcalcium-binding domain"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="f
7032..8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="fadD28"
/protein_id="CAB06100.1"
/protein_id="CAB06100.1"
/protein_id="G1:1781172"
/db_xref="g1:1781172"
/db_xref="g1:1781172"
/db_xref="syptremb1:p96290"
/translation="MSVRSLPAALRACARLQPHDPAFTFMDYEQDWDGVAITLTWSQL
/translation="MSVRSLPAALRACARLQPHDPAFTFMDYEQDWDGVTDE
/translation="MSVRSLPAALRACARLQPHDPAFTAVPLEVDLDLDAPNPGGGVTDE
/translation="MSVRSLPAALRACARLQPHDPAFTAVPLEVDLDLDAPNPGGGVTDE
RSDSVLSDSSPVAILITSSAVDDVVQHVARRPGESPPSITEVDLDLDAPNPGAFELA
RSDSVLSDSSPVAILITSSAVDDVVQHVARRPGESPPSITEVDLDLDAPNPGAFELA
EYPHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWHHLMASDFHAFSAAPNFAFELA
ARRTTDDDDMAGRDLGNILTILGGSERVQAATIKRFADRFAFENLQERVIRPSYGLAEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVYVATSKPGQPPETVDFDTESLSAGHÅKPCAGGGATSLISYMLPRSPIVRIVDSDTC
IECPDGTVGELWYHGDNVANGYWQKPDESERTFGGKIVTVFSPGTPEGFWLRTGDSGFV
TDGKMFIIGRIKDLLIVGRNHSPDDIEATIGEITRGRAAISVPGDRSTEKLVAIIE
LKKRGDSDQDAMARLGAIKREVTSALSSSHGLSVADLVLVAPGSIPITTSGKVRRGAC
LGTAAVLAICMLPIIGMRWGVAENPTRQGGAQVLPGNALPDVVVIKSARDLRDPAALI
AINQVSHRLVEVPGVRKVESAAWPAGVPWTDASLSSAAGRLADQLGQQAGSFVPAVTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VEQYRQDQFARLDA"
8520. .8558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1, PS00044 Bacterial regulatory proteins, lysR family
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement (5861.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="PS00012 Phosphopantetheine attachment
287. .23998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(203. .250)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="mas"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /clone="Y24G1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="mas"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="PS00606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Beta-ketoacyl synthases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EF-hand
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  calcium-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               active
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                               Вþ
                                                                                         Q
                                                                                                                                                                  В
                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                               7890
                                                                                                                                                                  7830
                                                                                                                                                                                                                                                                                                 7770
                                                                                                                                                                                                                                                                                                                                                                                                                                 7710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7230
                                                                                             781
                                                                                                                                                                                                                                721
                                                                                                                                                                                                                                                                                                                                                               661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ب
                           893;
```

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                          ctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtgcaacatgttgcgcggccgggggaatccccgccatcaattatcgaagttgatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            atctctgctccgcagggactcgagtacgtcgcctatctcggcgcgttgcaggccggg 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgaacgctgaatgtggcacaggagctgagccgttgtggttccacgggtgaccgcgctggtg 120
                                                                                                                                                                                                                                                                                                                                                                                                                        TATTTGCAATACACCTCCGGGTCCACCCGCACGCCGGTGGTGGTGATGTCCCATCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                         tatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTCGATCTGGACGCTCCGAATGGGTATACCTTCAAAGAAGACGAGTATCCATCTACCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GTGCAACATGTTGCGCGGGCCCCGGGGAATCCCCGCCATCAATTATCGAAGTTGATTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTACTGAGTGATTCGTCGCCGGTGGCCATTCTCACTACATCGTCTGCCGTGGACGACGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GATTACGAACAGGACTGGGACGGCGTTGCGATAACCCTGACGTGGTCGCAGCTGTATCGG
                                                                                                                                                                                                                                                                                                                                                   AACGTTCGGGTTAATTTCGAACAGCTGATGTCTGGCTACTTTGCGGATACCGACGGGATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATCTCTGCTCCGCAGGGACTCGAGTACGTCGTCGCCTTTCTCGGCGCGGTTGCAGGCCGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGAACGCTGAATGTGGCACAGGAGCTGAGCCGTTGTTGGTTCCACGGGTGACCGCGTGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9769. .9801
/gene="mmpL7"
/note="PS00639 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IKSMKSJIEDMSGAVDOLDSTYNWTLAGARQAQQYLDPMLAAARNLKNKTTELSEYLE
TIHTMIVGFTNCPDDVLCTAMKKVIEPYDIVVTGMNELSFADS
APRWAQMKSALAQVRSSVPKLETTIEPYDIVVTGMNELSFADS
APRWAQMKSALAQVRSSVPKLETTIEDAMPQTAQASAMLKANLSADFADTGEGGFHLS
RDLADPSYRHVRESMFSSDGTATRLFLYSDGOLDLAAAARAQQLEIAAGKAMKYGSL
VDSQUTVGGAAQIAAAVRDALIHDAVLLAVILLAVILLAVALASMRAGAVGAAVGVGVLAS
YLAALGVSIALMQOHLLDRELNALVPLYSFAVLASCGVPYLVAGIKAGRIADEATYGRAK
KGAVSGRGAVAPLAAALGGVFGAGLVLVSGGSFSVLSQIGTVVVLGLGVLITVQRAWLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="PS00639 Eukaryotic histidine active site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTPGRR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99
86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 891.8; DB 2;
Pred. No. 8.2e-179;
0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            thiol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (cysteine)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proteases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                720
                                                                                                                                                                                                                                        660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7289
                                                                                                                            7829
                                                                                                                                                                                                                                                                           7709
                                                                                                                                                                                                                                                                                                                                               7649
                                                                                                                                                                                                                                                                                                                                                                                                                        7589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7169
                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                       7889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
```

```
BASE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
MEDLINE
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
MBU75685
                                                                                                                В
                                                                                                                                                     δÃ
                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                      Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
KEYWORDS
                           망
                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LOCUS
                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                              COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                                     121
                                                                                                                   145
                           205
                                                                                                                                                          61
                                                                                                                                                                                                        85
                                                atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggg
                                                                                                                                       cgaacgctgaatgtggcacaggagctgagccgttgtggttgccacgggttgaccgcgttgttg
                                                                                                                                                                                                                          gattacgaacaggactgggacggcgttgcgataaccctgacgcggttcgcagctgtatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATCTCTGCTCCGCAGGGACTCGAGTACGTCGCCCTTTCTCGGCGCGCGTTGCAGGCCGGC
                                                                                                                CGAACGCTGAATGTGGCACGGGAGCTGAGCCGTTGTGGTTCCACGGGTGACCGCGTGGTG
                                                                                                                                                                                                      GATTACGAACAGGACTGGGACGGCGTTGCGATAACCCTGACGTGGTCGCAGCTGTATCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium |
U75685
U75685.1 GI:1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fitzmaurice, A.M. and Kolattukudy, P.E.

Open reading frame 3, which is adjacent to the m
synthatse gene, is expressed as an acyl coenzyme
Mycobacterium bovis BCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium; Mycobacterium tuberculosis complex.

1 (bases 1 to 1749)
Fitzmaurice, A.M. and Kolattukudy, P.E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (22-OCT-1996) Ann Marie Center, The Ohio State University,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Fitzmaurice, A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MBU75685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (bases 1 to 1749)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteriol.
                                                                                                                                                                                                                                                                                                                                                                                                                                351
                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
/product="acy1-coA synthase"
/db_xref="GI:165831"
/db_xref="gI:165831"
/translation="MAMSVRSLPAALRACACLQPHDPARTEMDY EDDWDGVAITLTWS
QLYRRTLNVARELSRCGSTGDRVVISAPGLEYVVAFLGAGGIAVPLSUPQGGVT
QLYRRTLNVARELSRCGSTGDRVVISAPQUVQHVARREGESPSIIEVDLDLDAPNCYTEK
EDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGIPPNNSALVSW
LPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWHLMASDFHAFSAAPNFAFE
LAARRTTDDDMAGRDLGNILTILSGSERVQAATIKFADRFARFNLQERVIRPSYGLA
EATVYVATSKPQQPPETVDFDTESLSAGHAKPCAGGGATSLISYMLPRSPIVRIVDSD
TCIECPDGTVGEIWVHGDNVGNGYWQKPDESERTFGGKIVTPSPGTPEGPWLRTGDSG
FVTDGKNFIIGRIKDLLIVYGRNHSPDDIETIOSITRGRCAAISVPGDRATEKLVAI
IELKKRGDSQDAMARIGAIKREVTSALSSSHGLSVADLVLVAPGSIPITTSGKVRRG
ACVEQYRQDQFARLDA"
51 a 518 c 517 g 363 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /db_xref="taxon:1765"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Mycobacterium
/strain="BCG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /clone_lib="pYUB18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GI:1658530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1749
                                                                                                                                                                                                                                                                                                                98.4%;
99.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1749 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acyl-CoA
                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                  Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2608-2615 (1997)
                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        synthase
                                                                                                                                                                                                                                                                                           8.6; DB 2;
. 8.3e-178;
tches 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           adjacent to the mycocerosic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Fitzmaurice, Neurobiotechnology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bovis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene, complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BCT
                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A synthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          19-APR-1997
                                                                                                                                                                                                                                                                                           0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  895
                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                          120
                                                                                                                                                                                                      144
                                                                                                                                                                                                                                                 60
                                                                                                              204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ä
                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                 REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                           VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MSGMYACSYN/c
                                                                                         FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                              JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                       ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           865
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           acgatcaagcgcttcgccgaccgctttgctcgcttcaatctgcaggagagggtga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCAGCACCGAATTTCGCCTTTGAACTAGCGGCACGAAGAACAACCGACGACGACGACGTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gcagcaccgaatttcgcctttgaactagcggcacgaagaacaaccgacgacgacgacatggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCACCGCCAAATTCCGCACTCGTATCCTGGCTACCCTTCTACCACGACATGGGTTTGGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggttttggta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aacgttcgggttaatttcgaacagctgatgtctggctactttgcgggataccgacgggatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACGATCAAGCGCTTCGCCGACCGCTTTGCTCGCTTCAATCTGCAGGAGAGGGTGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AACGTTCGGGTTAATTTCGAACAGCTGATGTCTGGCTACTTTGCGGATACCGACGGGATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CTCGATCTGGACGCTCCGAATGGGTATACCTTCAAAGAAGACGAGTATCCATCTACCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTGCAACATGTTGCGCGGCGGCCCGGGGAATCCCCGCCATCAATTATCGAAGTTGATTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtgcaacatgttgcgcggcggcccggggaatccccgccatcaattatcgaagttgatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TATTTGCAATACACCTCCGGGTCCACCCGCACGCCCGCTGGCGTGATGTCCCCATCAG
                                                                                                                                                                     Mycobacterium; Mycobacterium tuberculosis complex.

1 (bases 1 to 9699)
Mathur,M. and Kolattukudy,P.E.
Molecular cloning and sequencing of the gene for mycocerosic Molecular cloning and sequencing of the gene for mycocerosic Mycobacterium and Myc
                                                                                                                                                                                                                                                                                                                                  M95808.1 GI:149977
mycocerosic acid synthase.
Mycobacterium tuberculosis (strain
Mycobacterium tuberculosis
                                                                                                                                   from
                                                                                                                                                                                                                                                                    Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium; Mycobacterium tuberculosis complex.
                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium
M95808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MSGMYACSYN
                                                                                                                                   Mycobacterium tuberculosis iol. Chem. 267, 19388-19395
/strain="BCG"
/db_xref="taxon:1773"
                                                                                       Location/Qualifiers
                                           /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9699
                                                                                                                                                                                                                                                                                                                                                                                                                                                 bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ďď
                                                                                                                                                                                                                                                                                                                                                                                                                                                 mycocerosic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA
                                                                                                                                                     var.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 acid
                                                                                                                                     (1992)
                                                tuberculosis'
                                                                                                                                                                                                                                                                                                                                                         BCG, pathovar
                                                                                                                                                          bovis
                                                                                                                                                                                                                                                                                                                                                                                                                                                 synthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BCT
                                                                                                                                                          Bacillus
```

gene,

complete

cds.

26-APR-1993

895 979

> 840 864

924

804 720 744 660 684

780

600

624 540 480

564

420 444 360 384 300 324

504

bovis)

Calmette-Guerin

enzyme

CDS

```
VVVSVVASPQSTVIGGTSDTVRDLIARWEQRDVMAREVAVDVASHSPQVDPILDDLAA
ALADLARWTRKVPYYSATLEPDREQPVCDGAXWVDRILRITVQFAAAVQAAMEDGYRVF
ALWSPHPLLTHAVEQTGRSLDMSVAALAGMRREQPLPHGLTELHRAGAALDYSA
ALYBAGRLUDAPLPAWTHARLFIDDDGGEQRAGGACTITVHPLLGSHVRLTEEPERHVM
QGDVGTSVLSWLSDHQVHNVAALPGAAYCEMALAAAAEVFGEAAEVRDITFEQMLLLD
EQTPIDAVASIDAFGVUNFTVETNRDGETTRHATAALRAAEDDCPPPGYDITALLQAH
PHAVNGTAMRESFAERGVTLGAAFGGLITTAHTPRREPRREVRSCPRRSGSRAPTE
STRRCWTLVSSRSARASSRYGHWWPAVAVGCAQPACLRAYPQCPLLLHAVDQGLQRRD
PRWEADLDVLDEHGTVLLAVRGLRMGTGTSERDERDRLVSERLLTLGWQQRALPEVGD
GEAGSWLLIDTSNAVDTPDMLASTLTDALKSHGPQGTECASLSWSVQDTPPNQQAGLE
                                                                                                                                                                                                                                                                                                                                                                                                                              TGHQVGDRVGGFSEGGCWRTFLTCDANLAVTLPPGLTDEQAITAATAHATAWYGLNDL AQIKAGDKVLHSATGGVGQAAISIARKGAEIFATGAGWPAKRMLRDWGVEHVYDSR SVEFAEQIRRDTDGYGVDIVLNSLTGAAQRAGLELLPFGGRFVEIGKADVYGNTRLGL FPFRRGITFYYLDLALMSVTQPDRVRELLATVFKLTADGVLTAPQCTHYPLAEAADAI RAMSNAEHTGKLVLDVPRSGRRSVAVTPEQRPLYRRDGSYIITGGLGGLGLFFASKLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /evidence=experimental
/product="mycocerosic acid synthase"
/product="mycocerosic acid synthase"
/product="mid-"AAA2369.1"
/db_xref="GI:149980"
/translation="MESRVTPVAVIGMGCRLPGGINSPDKLWESLLRGDDLVTEIPPD
RWDADDYYDEPPGYPGRSVSRWGGFLDDVAGFDAEFFGISERRATSIDPQQRLLLETS
RWDADDYYDEPPGYPGRSVSRWGGFLDDVAGFDAEFFGISERRATSIDPQGRLLLETS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /protein_id="AAA25368.1"
/db_xref="GI:149979"
/db_xref="GI:149979"
/db_xref="GI:149979"
/db_xref="GI:149979"
/db_xref="GI:149079"
/db_xref="GI:149079|
/db_x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
/protein_id="AAAA5367.1"
/protein_id="AAAA5367.1"
/db_xref="70(1:149978"
/translation="MDYEQDWDGVAITLTWSQLYRRTLNVARELSRCGSTGDRVVISR
/translation="MDYEQDWDGVAITLTWSQLYRRTLNVARELSRCGSTGDRVVISR
PQGLEEVVARELGALQAGRIAVPLSVPQGGVTDDRSSVLSDSSVLSDSSVAILTTSSAVDDVV
PQGLEEVVARELGALQAGRIAVPLSVPQGGVTDDRSSVLSDSSVLSDSSVAILTTSSAVDDVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLGSQLRGRDGVVIVYGPRVGDPDEHSLLAGREQVRHLVRITRELAËFEGELPRLFVV
TRQAQIKKPHDSGERANLEQAGIRGLLRVISSHPMLRTILIVDUBHTDVERVAQQLL
SGSEEDETANRAGDMVVARITPSPLGHEERRYAVLDPDHDGMRVQVRRPGDLQTLEFV
ASDRVPPGPGQIEVAVSMSSINFADVLIAFGRFPIIDDREPQLGMDFVGVVTAVGEGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MLSSTSSDALRQTARQLATMWEEHQDCVAASDLAYTLARGRRHRPVRTAVVAANLPEL
VEGLREVADGDALYDAAVGHGDRG PVWVFSGQGSQWAAMGTQLLASEPVFAATT AKLE
PVIAAESGESVTEATTAQQTVTGIDKYQPAVFAVQVALAATMEQTYGVRPEQAVVGHSU
GESAAAVYAGALSLEDAARVICRRSKLMTRIAGAGAMGSVELFAKQVNSELMARGIDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TETLTMPSEDAQVAVYRAALAAAGVQPETVGVVEAHGTGTPIGDPIEYRSLARVYGAG
TPCALGSAKSNMGHSTASAGTVGLIKAILSLRHGVVPPLLHFNRLPDELSDVETGLFV
PQAVTPWPNGNDHTPKRVAVSSFGMSGTNVHAIVEEAPAEASAPESSPGDAEVGPRLF
                                                                                                                                                                                                                                                                               ALLGSPGQGAYAAANSWYDVFAHWPRAQGLPVSAIAWGAWGEVGRATFLAEGGEIMIT
PEEGAYAFETLVRHDRAYSGYIPILGAPWLADLVRRSPWGEMFASTGQRSRGPSKFRM
                                                                                                                                                                                                                                                                                                                                                          AAGCGRIVLTARSQPNPKARQTIEGLRAAGADIVVECGNIAEPDTADRLVSAATATGL
PLRGVLHSAAVVEDATLTNITDELIDRDWSPKVFGSWNLHRATLGQPLDWFCLFSSGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QGMLSSTGRCHSFDADADGFVRSEGCAMVLLKRLPDALRDGNRIFAVVRGTATNQDGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QHVARRPGESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSH
QNVRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTS
       /transl_table=11
/protein_id="AAA25370.1"
                                                                                                                                                                                                           IRLTPKVIATNKTARALAQYLADTLAEEQAAAPAAS
                                                                                                                                                                                                                                       {	t ELLSLPQDEWAGRLRRLLVEQASVILRRTIDADRSFIEYGLDSLGMLEMRTHVETETG}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \mathtt{AHTLGLHGPAMTFDTACSSGLMAVHLACRSLHDGERDLALAGGCAVLLEPHACVAASA}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RVQAATIKPFADALLASICRRG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PVSFLQRPARWMHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(153. .1049)
/note="ORF"
                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /function-"fatty
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  trans.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1741. .8073
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="ORF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      l_table=11
                                                                                                                                                               (8468.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      acid elongating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      enzyme"
                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
       δÃ
                                                                               밁
                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 886;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1046
       841
                                                                                                                                                       781
                                                                                                                                                                                                                                       326
                                                                                                                                                                                                                                                                                                                                                                                              386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          926
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  986
                                                                                                                                                                                                                                                                                                                   721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
acgatcaagcgcttcgccgaccgctttgctcgcttcaatctgcaggagagggtga 895
```

CDS

CDS

CDS

```
/db_xref="G1:149981"
/translation="MPSRVGSVEMFPGSVIRKLSHSEEVFAQYEVFTSMTIQLRRVID
VDALSDAFDALLETHFVLASHLEQSSDGGMNLVADDLLHSGICVIDGTAATNGSPSGN
AEHRLDQSVSLLHLQLMVREGGAELTILYLHHCMADGHHGAGLVDELFSRYTDAVTTGD
PGPITPQPTPLSMEAVLAQRGIRKQGLSGAERFMSVMYAYEIPATETPAVLAHGGLPQ
AVPYTRLWLSKQQTSDLMAFGREHRLSLNAVVAAAILLTEWHYRNTPHVPIPYVYPVD
LRFYLAPPVAPTEATNLLGAASYLAEIGPNTDIVDLASDIVATLRADLANGVIQQSGL
HFGTAFEGTPPGLPPLALLH"
```

1 gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg 60 999c9t9acctc9gcaacatactgaccatcctcagcggtagcgagcggggtacaggccgcg 840 otcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg 420 cgaacgctgaatgtggcacaggagctgagccgttgtggttccacgggtgaccgcgtggtg 120 atetetgeteegeagggaetegagtaegtegtegeetateteggegegttgeaggeeggg. 180 ttcctgcagcgcccggcccggttggatgcacttgatggccagcgattttcacgccttttcg 720 ccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggtttggta 600 tatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatcag 480 cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg 240 GATTACGAACAGGACTGGGACGGCGTTGCGATAACCCTGACGTGGTCGCAGCTGTATCGG 987 TTCCTGCAGCGCCCGGCCCGGTGGATGCACTTGATGGCCAGCGATTTTCACGCCTTTTCG CCACCGCCAAATTCCGCACTCGTATCCTGGCTACCCTTCTACCACGACATGGGTTTGGTA 447 AACGTTCGGGTTAATTTCGAACAGCTGATGTCTGGCTACTTTGCGGATACCGACGGGATT 507 TATTTGCAATACACCTCCGGGTCCACCCGCACGCCCGCTGGCGTGGTGATGTCCCATCAG CGCATCGCCGTGCCGCTTTCGGTTCCACAAGGCGGCGTTACCGATGAACGTTCCGATTCG ATCTCTCGTCCGCAGGGACTCGAGTACGTCGTCGCCTTTCTCGGCGCGGTTGCAGGCCGGC CGAACGCTGAATGTGGCACGGGAGCTGAGCCGTTGTGGTTCCACGGGTGACCGCGTGGTG Similarity 1691 Conservative a 96 . 48; o 0; 3280 Score 870.2; DB 2; Pred. No. 3.9e-174; 0; Mismatches 8; g 1751 t Length 9699; 1; Gaps 567 807 867 927 327 1.

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MTCY409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                 misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACGATCAAGCCGTTCGCCGA-CGCTTTGCTCGCTTCAATCTGCAGGAGAGGGTGA 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CBIO 15A Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhillesanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2224815.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MTCY409 30352 bp DNA BCT
Mycobacterium tuberculosis H37Rv complete genome;
Z97188 AL123456
Z97188.1 GI:3261805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Notes:
Details of M. tuberculosis sequencing at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Parkhill, J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Erratum:[[published erratum appears in Nature 1998 Nov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2;396(6707)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1 to 30352)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 30352)
                                                                                             /gene="csp"
95. .1714
                                                                                                                                                                                                                 /note="fragment physical clone" 18. .23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     If this cannot be identified
/note="Rv3811, (MTV026.16), len: 539. ,csp, some short
similarity to gp|X66078|CGCOPIG_1 C. glutamicum cop1 gene
                                                                                                                                                                                                                                                                                                                                                                                                                          1. .30352
                                                        /gene="csp"
                                                                                                                                                                               /note="AsnI site,
                                                                                                                                                                                                                                                                                                                                  /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                     /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Mycobacterium tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                          designated v026. Does not represent a
                                                                                                                                                                                  fragments S/G4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        we choose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   segment 158/162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  17-JUN-1998
```

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          inote="Rv3812, (MTV026.17,MTCY409.18c), len: 540. Glycine rich hypothetical protein belonging to PGRS (PE) family, similar to many e.g. YM36_MYCTU Q10873 hypothetical 53.7 kd protein cy39.36c (558 aa), fasta scores; opt: 327 z-score: 458.5 E(): 2.5e-18, 28.5% identity in 502 aa overlap, also similar to MTCY17H7B_27; MTCT5_25; MTCY493_24; MTCY4941_4; MTCY39_36; MTCY1A11_4; MTCY359_33;MTCY130_10; MTCY98_9 etc."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MSFVVTVPEAVAAAAGDLAAIGSTLREATAAAAGPTTGLAAAAA DDVSIAYSQLFGRYGQEFQTVSNQLAAFHTEFVBTLNRCAAAY.LNTESANGGQLFGQI EAGQRAVSAAAAAAFGGAYGQLVANTATNLESLYGAMSANDFPFLRQI I ANQOVYWQQ LAAALAANAVQNFPALVANLPAALDAAVQQFLAFWAAYYLQQI I SSQIGFNQLFATTVG QGVTSVIAGWPNLAAELQLAFQQLLVGDYNAAVANLGKAMTNLLVTGFDTSDVTIGTM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTISYTAKPKLLGPLGDLFTIMTIPAQEAQYFTNLMPPSILRDMSQNFTNVLTTLSN
PNIQAVASFDIATTAGTLSTFFGVPLVLTYATLGAPFASLNAIATSAETIEQALLAGN
YLGAVGALIDAPAHALDGFLNSATVLDTPILVPTGLPSPLPPTVGITLHLPFDGILVP
                                                                                                                                                                                                                    to many hypothetical proteins eg. YXEH_BACSU P54947 hypothetical 30.2 kd protein in idh-deor (270 aa), firesults; opt: 329 z-score: 456.0 E(): 2.2e-18, 32.28
                                                                                                                                                                                                                                                                                                                                                           complement(3691. .4512)
/gene="Rv3813c"
                                                                                                                                                                                                                                                                                                                                                                                                                           complement(3691. .4512)
/gene="Rv3813c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   active site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="MAATVVIVAWIANRPPASSHEPSBTPNTOLAEOPLIGLGGVTV
RELTQDTPFSLVALTGDLAGTSARVRAKREDGOWGPWYQTEYETEPRDPAGTDGSVEL
GGLUBGPRSTDPVFYGTTTTVQVAVTURPIDAPTTQPPAGREPNDLLDSGLGYRPATKE
OPFGQNISAILISPPQAPPGTQWTPPTAVTMAGQPPAIISRAEWGADESLRCETPEYD
                       /product="hypothetical protein Rv3813c"
/protein_id="CAB10018.1"
/db_xref="GI:2224832"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /db_xref="taxon:1773"
/clone="Y409"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2170. .2962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PHPVTATISFPGAPVPIPGFPTTVTVFGTPFMGMAPLLINYIPQQLALAIKPAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product="PE_PGRS"
/protein_id="CAB10020.1"
/db_xref="GI:3261807"
/db_xref="SPTREMBL:007811"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="possible 1868. .3382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DAQPITGAIYEAWASQSYERGPLGLPTSAEIQEPLQITQNFQHGTLNFERLTGNVTEV
VDGITTPLATRPPSGPTVPPEHFTLPTHPIT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
/product="csp"
/protein_id="CAB10019.1"
/db_xref="GI:3261806"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      forPS1. (657 aa), FASTA scores: opt: 250 z-score: 244.4
E():4.2e-06 39.4% identity in 109 aa overlap, Contains
PS00687Aldehydedehydrogenases glutamic acid active site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Mycobacterium tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1868. .3382
/gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="PE_PGRS"
1868. .3382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        392. .415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SMVDLQSAGSSYTTFPGGAIARLPAIFTHRDVGNTDCPGNAAYAVMDEIRDIAAHFND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RGVRAAVVHHTAGSNDYSPLESAGIVKAIYTYHSKTLGWCDIAYNALVDKYGQVFEGS
AGGLTKPVEGFHTGGFNRNTWGVAMIGNFDDVAPTPIQIRTVGRLLGWRLGMDDVDPR
/db_xref="SPTREMBL:007810"
                                                                                                                            transl_table=11
                                                                                                                                                                                            identity in 267 aa overlap"
                                                                                                                                                                                                                                                                                                                     /note="Rv3813c, (MTCY409.17), len: 273. Unknown, similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ∕strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="csp"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPEELIKALEGGAIYQRWQALGGMNSALGAPTSPEADAADGARYATFAKGAMYWSPVT
                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1859.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="PS00687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SPTREMBL:086334"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .1862
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Aldehyde dehydrogenases glutamic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGRS, agga"
                                                                                                                                                                                                                                                                fasta
```

CDS

gene RBS

gene

translation="MKPTVPALVACDVDGTLLDDGETVTKRTRDAVHAAVDAGTHFIL"

source

```
Best Local Similarity Matches 599; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
25247
                                                                                                                                                                  25187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RBS
                                              61 cgaacgctgaatgtggcacaggagctgagccgttgtggttccacgggttgaccgcgtggtg 120
    CGAACCCTAAACGTTGCAGCAGAAGTCCGCCGCCATGCCGCAATTGGTGACCGTGCAGTG
                                                                                                                                                                                                            gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg 60
                                                                                                                                                                  GATTACGAACGGGATTCGGAGGGCATAAGTGAAAGCCTGACGTGGTCGCAGGTGTATCGG
                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(4527. .5312)
/gene="Rv3814c"
complement(4527. .5312)
/gene="Rv3814c"
complement(4527. .5312)
/gene="Rv3814c"
/notte="Rv3814c"
/nott
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="Rv3815c"
/gene="Rv3815c"
/note="Rv3815c, (MTCY409.15), len: 251
/note="Rv3815c, similar to TR:Q59188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(6089. .6868)
/gene="Rv3816c"
/gene="Rv3816c"
/note="Rv3816c"
/note="Rv3816c, (MTCY409.14), len: 259. Probable
acyltransferase, similar to several acyltransferases
ARS_ECOLI p31119 2-acylglycerophosphoethanolamine
acyltransferase (719aa), opt: 119 z-score: 222.3 E():
2.3e-05, 22.0% identity in 182 aa overlap. Also simil
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1-ACYL-SN-GLYCEROL-3-PHOSPHATEACETYLTRANSFERASE from BORRELIA BURGDORFERI (135 aa), fastascores; opt: 142 z-score: 222.9 E(): 2.1e-05, 29.5% identity in 88 aa overlap. Also similar to ORF's on either side MTCY409.16 (60.4% identity in 245 aa overlap) and MTCY409.14(55.7% identity in 246 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VIPGAGLAVERIGERAHDTATPQFVSSPGYEHAWLNPDNTEVSIDHLLSAPAIKLLIR
KAGAASADMAAELAKHVGFEGDITYSTNNGLVEIVPLGISKATGVDEIARPLGISDAE
VVAFGDMPNDVPMLLRAGLGVAMGNAHPDALAVADEVTAPNSEDGVARVLERWNS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="Rv3816c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="Sptrembl:007808"
/tabnslation="Maeptyrvelilaquivatgir:Tyvgbenvpdoggavvainh
/tabnslation="Maeptyrvelilaquivatgir:Tyvgbenvpdoggaggavainh
Tsyvdwlpaalamhrarrrmrpmikaemogrvrlvnflirhtripvddrgaggsavava
VQRLREGELYGVYPE&T:SR&FELKGFKTGAARMAABADVPIVPVVVWGAQRIWTKDH
PRQIGRAKVPVTVQVGRPLRAAAGIEQTNAALRESMTALLWQAQERYPHPAGAYWVPR
RLGGGAPTLAEAARMEADEAAARAASRTPHESR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="possible RBS upstream of Rv3814c" complement(5330. .6085) /gene="Rv3815c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="maepffrmmeilvpsivaangnkitfegleniperggalialnh
TSYVDWVPASIAAHHRRRRLRFMIKAEMQDVRAVNYVIKHAQLIPVDRSVGADAYAVA
VQRLRAGELVGLHPEATISRSLELREFKTGAARMALEAQVPIIPMIVWGAHRIWPKDH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="hypothetical protein
/protein_id="CAB10009.1"
/db_xref="GI:2224831"
/db_xref="SPTREMBL:007809"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="hypothetical
/protein_id="CAB10008."
/db_xref="GI:2224830"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement (5319.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PKNLFRNKIPIVAAIGSPVRPEGNAEQLNAVLRQAMNAILYRVQEEYPHPKGEHWVPR
RLGGGAPTVEESROLRIAELAKRRQKRGYDGVTSSRRSQVGPH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATGRPPRWVRPIVDALGFAPMAVCANGAVIYDPGTDRVMSVRTLPVDALATLAEVATR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                             47.2%;
67.5%;
                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                           Score 426.2; DB 2
Pred. No. 1.3e-80;
D; Mismatches 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 6868)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .5323)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 protein Rv3815c"
                                                                                                                                                                                                                                                                                                                                                                                                            DB 2;
                                                                                                                                                                                                                                                                                                                               288;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rv3814c"
                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                    Length 30352;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             overlap. Also similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         251. Probable
                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .3 E():
                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                             25246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     eg.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ç
                                                                                                                                                                                                                                                                                                                               0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
```

멍 Qy DЬ QΨ

RESUL MSCYA LOCUS DEFIN ACCES VERSIV EXYWO SOURC ORG ORG TIT TIT JOU	Qy	Qу Дъ	Qy Db	Qу	Qу Дъ	Qу Db	Qу Дъ	ру	pb oy	ОУ	Qy Дъ	Qy Db	Qу Дъ
T T 09/c O9/c SION SION SION SION SION SION SION SION	841 26027	781 25967	721 25907	661 25847	601 25787	541 25727	481 25667	421 25607	361 25547	301 25487	241 25427	181 25367	121 25307
MSGY409 41321 bp DNA BCT 10-DEC-1996 ADD00017 ADD00017.1 GI:1717740 Mycobacterium tuberculosis (clone: y409) ds-DNA. Mycobacterium tuberculosis Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacterium tycobacterium tuberculosis 1 (bases 1 to 41321) Du.L. Direct Submission Submitted (11-OCT-1996) L.Du, Genome Therapeutics Corporation, 100 Beaver Street, Waltham, MA, USA, 02154 du@cric.com Cce 1. 41321	acgatcaagcgcttcgccgaccgctttgctcgcttcaatctgcagga 887	gggcgtgacctcggcaacatactgaccatcctcagcggtagcgagcg	gcagcaccgaatttcgcctttgaactagcggcacgaagaacaaccgacgacgacatggcc 780 	ttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcacgccttttcg 720 	ataggaatttgcgcaccaattctgggtggataccccgcggtgctcaccagcccggtgtcg 660 	ccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggtttggta 600	aacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacgggatt 540	tatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatcag 480	ctogatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg 420 	gtgcaacatgttgcgcggcggcccggggaatccccggccatcaattatcgaagttgatttg 360 	gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc 300 	cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg 240	atototgotocgoagggaotogagtacgtogtogcotatotoggoggottgcaggooggg 180

segment 67/162. 17-JUN-1998

```
망
                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                 8
                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
Matches 599
                                                                                                                                                                                                                                                                                                                                                                                                       17716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                17896
                                                              17476
                                                                                                                                                17536
                                                                                                                                                                                                                                     17596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                17836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18196
                                                                                                    841
                                                                                                                                                                                        781
                                                                                                                                                                                                                                                                             721
                                                                                                                                                                                                                                                                                                                                                               661
                                                                                                                                                                                                                                                                                                                                                                                                                                                 601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
σ
                                                                                                                                                                        999c9t9acctc9gcaacatactgaccatcctcagcggtagcgagcgggtacaggccgcg
                                                                                                                                                                                                                                                                                                                                           ttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcacgccttttcg
                                                                                                                                                                                                                                                                                                                                                                                                                             ataggaatttgcgcaccaattctgggtggataccccgcggtgctcacccagcccggtgtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acgatcaagcgcttcgccgaccgctttgctcgcttcaatctgcagga
                                                                                                                                                                                                                                  GCGGCACCGAACTTCGCCTTCGAACTGACGGCAGCAAAAGCAATAGATGACGACTTGGCC
                                                                                                                                                                                                                                                             gcagcagcagaatttcgcctttgaactagcggcacgaagaacaaccgacgacgacatggcc
                                                                                                                                                                                                                                                                                                                                                                                                       CTGGGAGTTTGTGCGCCGATTATCGTAGGATGCGGCGCTGTGCTCACAAGCCCGGTGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGCCATTGGACCTTTTCATTATGTCGTGGCTACCGTTCTATCATGACATGGGTTTGGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggttttggta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AATATATTGGCAAATTTCCAGCAGATGATTTCCGCCTATTTCGCCGACACCGGAGCCGTA 17777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TATTTGCAGTATACGTCGGGATCGACCCGCCACACCTGCCGGTGTAATGATTACCTACAAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatcag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggg 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGAACCCTAAACGTTGCAGCAGAAGTCCGCCGCCATGCCGCAATTGGTGACCGTGCAGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ogaacgctgaatgtggcacaggagctgagccgttgtgggttccacgggtgaccgcgttggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GATTACGAACGCGATTCGGAGGGCATAAGTGAAAGCCTGACGTGGTCGCAGGTGTATCGG 18257
                                                            ACCCTCAAGCGCTTTGTCGACCGGTTTAGCCGTTTCAATCTTCGAGA
                                                                                                                                                                                                                                                                                                                       TTTCTGCAGCGACCAGCCCGGTGGCTGCAATTGATGGCACGCGAGGGCCAGGCGTTTTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTAGATCTGGACTCGCCGATACGATCTAATATTGTGGACGATTCTCTCCAAACAACCGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTCCCGCGCGTTACGCCACCGCCCGGTATTGCCAGCCCGCCAACGGTTGCGGTCGATCAA 17957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTAGTGCGTGACGCGAAACCCCAATGTCGTTCTGACAACATCCGCGATAATGGGCGATGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CTTATTGCGGTTCCACTTTCGGCTCCGCTCGGCGCGCCAGCGATGAACGTGTTGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATATTGGCCCCACAAGGACTCGATTATATTGTTGCTTTTCTGGGCGCTTTACAGGCCGGT 18137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           599;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /clone="y409"
12527 c 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Mycobacterium tuberculosis"
/db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          47.2%;
67.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13809 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 426.2;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2; DB 2;
1.2e-80;
hes 288;
                                                                                                                                                AGTGAAAGGGTGCATCCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 41321;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                17477
                                                                                                                                                                                        840
                                                                                                                                                                                                                                                                          780
                                                                                                                                                                                                                                                                                                                     17597
                                                                                                                                                                                                                                                                                                                                                             720
                                                                                                                                                                                                                                                                                                                                                                                                       17657
                                                                                                                                                                                                                                                                                                                                                                                                                                                 660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    17897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         18077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AUTHORS
                                                                                                                                                                                                          gene
                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                                                                                                                                                                                                                                                     source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhildsanger.ac.uk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E., Tekala, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLeau, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, N.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                              initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position (+ C. CAUTION: In some cases we may not have predicted the correct third to be considered.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Parkhill, J.
Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          On Jun 27, 1998 this sequence version replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Erratum:[[published erratum 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complete genome sequence
Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Deciphering the biology of Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis. Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MTV045 11042 bp DNA
Mycobaterium tuberculosis H37Rv
AL022000 AL123456
AL022000.1 GI:3261541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Details of M. tuberculosis sequencing at the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1 to 11042)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (bases 1 to 11042)
                               complement(23..6349)
/gene="pks5"
/note="Rv1527c, (MTV045.01c-MTCY19G5.01), len: 2108.pks5, probable polyketide synthase, highly similar to many, e.g. mCAS_MYCBO_002251 mycocerosic acid synthase from Mycobacterium bovis (2110 aa), fasta scores; opt: 6270 z-score: 7088.8 E(): 0, 63.6% identity in 2126 aa overlap"
                                                                                                                                                                                    complement(23.
/gene="pks5"
                                                                                                                                                                                                                                  /clone="Y19G5"
                                                                                                                                                                                                                                                                        /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                    /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                             /organism="Mycobacterium
/strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                       1. .IIU42
               /codon_start=1
                                                                                                                                                                                                                                                                                              /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                      /db_xref="taxon:1773"
                                                                                                                                                                                                            .6349)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       appears
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complete
                                                                                                                                                                                                                                                                                                                                                                                 tuberculosis'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'n.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sanger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gi:2916949
```

Centre

Nov

from the

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="possible RBS for Rv1527c"

/note="possible RBS for Rv1527c"

complement(6893. 7390)

/gene="papA4"

complement(6893. 7390)

/gene="papA4"

/note="Rv1528c, (MTV045.02), len: 165. Unknown, but some similarity to C-terminal part of hypothetical proteinsfrom M. tuberculosis and M. leprae, eg.

gp[z97188|MTCY409_10 M. tuberculosis cosmid (468), 37 identity in 66 aa overlap; or U00010_11 M. leprae cosmid 1770, 35.7% identityin84 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RYCCTTVTACGVGADADLDULDEHGAVVLAVRGLOLGTGASQASERARVLGERLLSIE
WHERELPENSHÆPGAWLLISTCDATDLVAAQLTDALKVHDAÇCTTMSWPQRADHAAQ
ARALRDOLGTGGFTGYEVELTAPQTGDPDAESEVRGGELVKHVVRIARELPEITPAÇER
LYVLTHNAQAVLSGDRPNLEOGGMRGLLRVIGAEHPHLKASYVDVDEQTGAESVARQL
LAASGEDETAWRNDQWYTARLCPAPLREDERQTTVVDHAEAGKHALQIRTPGDLQTLEF
AAFDRVPPGPGEIEVANTASSSINEADVLVTFGREYQTLDGACGPQDLGTDEAGVVSAVGPG
VSELKVGDRVGGMSPNGCWATFVTCDARLATRLPEGLTDAQAAAVTTASATAWYGLQD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GIRISATEINTTVRGLADLMCDKLAADRDAPAPA" 1495. .11004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RSVEFAEQIRRDTAGYGVDIVLNSVTGAAQLAGLKLLALGGRFIEIGKRDIYSNTRLE
LLPFRRNLAFYGLDLGLMSVSHPAAVRELLSTVYRLTVEGVLPMPQSTHYPLAEAATA
IRVMGAAEHTGKLILDVPHAGRSSVVLPPEQARVFRSDGSYIITGGLGLGLFLAEKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QVDPILDELAEALAEISPLQPEIPYYSATSEDPREEPYCDAYYWVDNLRHTVRFAAAV
QAALEDGYRVFTELTPHPLLTHAVDQTARSLDMSAAALAGMRREQPLPHGLRALAGDL
YAAGAAVDFAVLYPTGRLINAPLPTWNHRRLLLDDTTRIAHANTVAVHPLLGSHVRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EPVFAATIAAIEPLIAAESGFSVTEAMTAPEVVTGIDRVQPTLFAMQVALAATMKSYG
VAPGAVIGHSLGESAAAVVAGALCLEDGVRVICRRSALMTRIAGAGAMASVELPAQQV
LSELMARGVNDAVVAVVASPQSTVIGGATQTVRDLVAAWEQRDVLAREVAVDVASHSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AIETNLEVPQEITPWPGADQETPRRAAVSSYGMTGTNVHAIVEQAPVPAPESGAPGDT
PATPGIDGALLFALSASSQDALRQTAARLADWVDAQGPELAPADLAYTLARRRGHRPV
RTAVLAATTAELTEALREVATCEPPYPPAVGQDDRGPVWVFSGQGSQWAGMGADLLAT
                                                                                       /gene="fadD24"
7442. .9196
                                                                                                                                                                                                                                                                                                                             /translation="MTQLPQPTWRWWQQRETEQVQSSHIDGEIVGALIPDLAVLHSED
ASRAAVGREKHRCSLDPLGGGFRSRRASMPAGALLLSAVIAIQLDRMNARVFGDGWIG
AQACMWVNKFHEESTVTALSPSSPIAQGSIARHPETMQSAYVRIAEGGSRDVAPAAQL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="fragment designated v045. Does not represent physical clone"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AALVGSPGQGAYAAANSWLDTFTHWRRAQDLPATSIAWGAWGQIGRAIAFAEQTGDAI
APEEGAYAFETLLRHNRAYSGYAPVIGSPWLTAFAQHSPFAEKFQSLGQNRSGTSKFL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PEEPERHVWQGEVGTVTQPWLADHQIHGAAALPGAAYCEMALAAARAYLGEASEVRDI
RFEQMLLLDDETPIGVTATVEAPGVVPLTVETSHDGRYTRQLAAVLHVVREADDAPDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QHRLLLETSWEAMEHGGLTPNQMASRTGVFVGLVHTDYILVHADNQTFEGPYGNTGTN
ACFASGRVAYAMGLQGPAITVDTACSSGLTAIHLACRSLHDGESDIALAGGVYVMLEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MGKERTKTVDRTRVTPVAVIGMGCRLPGGIDSPDRLWEALLRGDDLVTEIPADRWDIDEYYDPEPGVPGRTDCKWGAYLDNVGDPDPEFFGIGEKEAIAIDP
7442. .9196
/gene="fadD24"
/note="Rv1529, (MTV045.03), len: 584. fadD24,
                                                                                                                                                                           /note="possible
7442. .9196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product="papA4"
/protein_id="CAA17588.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(6358.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \mathtt{AELVDLPREEWPDRLRRLLSKQVGLILRRTIDTDRLLSEYGLDSLSSQELRARVEAET}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LPLRGVLHAAAVVEDATLANITDELIERDWAPKAYGAWQLHRATADQPLDWFCSFSSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ANAGAGRIVLSSRSQPSQKALETIELVRAIGSDVVVECGDIAQPDTADRLVTAATATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LARIKAGDKVLIHSATGGVGQAAIAIARAAGAQIYATAGNEKRRDLLRDMGIEHVYDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LPGPLRSQVKAYGVHPVLLDACFQSVAAHPAVQGMADGGLLLPLGVRRLRSYGSARHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPQKNIAELLASHPHKVDGAEVRQWLDKRGHRLGPAFAGLVDAYIAEGAGDTVLAEVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LAEVYGNDGPCALASVKTNFGHTQSAAGALGLMKAVLALQHGVVPQNLHFTALPDKLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAANQDGHTVNIATPSRSAQVAAYREALDVAGVDPATVGMVEAHGPGTPVGDPIEYAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   {\tt RRFASGSALGMLSATGRCHAFDVSADGFVSGEGCVMLALKRLPDALADGDRILAVIRG}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /protein_id="CAA17592.1"
/db_xref="GI:3261542"
                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="SPTREMBL:053902"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="SPTREMBL:053901"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'db_xref="GI:2916951"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .6361)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               but
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              37.98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               shows
```

gene

RBS

CDS

gene CDS

Ş Ъ

121

7640

20

181

Вb Qy рь

7580

61

7520

RBS

RBS

```
Query Match
Best Local S
Matches 596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   misc_teature
                                                                                                                                                                                                                                                                                                 atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggg 180
                                                                                                                                                                                                                     cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg 240
                                                              ATACTGGCACCGCAGGGAATCGAATACGTCGTTTGGATTTCTCCGCCGCTTGCAGGCCGGA 7699
                                                                                                                                                                                   CGAATGCTCAATGTCGCCGAGCCGCTCCGGCATGTGGGGGGCGACCGGTGATCGGGCAGTG
                                                                                                                                                                                                                                                                                                                                                                                                                           similarity 66.5 596; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         signature"
10399. .10402
/gene="adh"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (402 aa)FASTAScores: opt: 423 z-score: 484.4 E(): 1.8e-19; 31.7% identity in 341aa overlap; Contains PS00059 Zinc-containing alcohol dehydrogenases signature. TBparse score is 0.919"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Rv1530, (MTV045.04), len: 367.adh, Probable alcoholdehydrogenase, zinc-dependent, similar to many gp|AE0009|AE000958_23 Archaeoglobus fulgidus section
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="adh"
9313. .1041
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MVASSIPTALRERASVHPNGAAITYIDYEQDWAGVAETLTWSQL
YRRMLLWAEDLHHVGANGDRAVILAPQGIEYVVGFLGALQAGRIAVPLPVPHAGAHDE
RTISVLSDTSPAVILTTSGAVDDVRECAQPQPGQSAPSIVELDLLDLDSRQRSRSPGA
RPTGRDTPETAYLQYTSGSTRTPAGVMVSNKNVFANFEQIVADFFAPEGGVPPDITV
VSWLPLYHDMGLLLGAIMPILAGVPTVLTSPVGFLQRPARWIQLLARNGRTISAGPNF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   highlysimilar to possible polyketide synthase MTCY409.04c (584 aa),63.2% identity in 584 aa overlap, or MBU75655_1 M. bovisacy1-CoA synt (582 aa), 65.6% ident.', in 582 aa overlap and many other mycobacterial hypothetical proteins: MTCY1965_7(583 aa) 68.7% identity in 584 aa overlap or MTCY24G1_8(580 aa),66.0% identity in 582 aa overlap, or U00010_6 M.leprae cosmid B1170, (372 aa), 57.6% identity in 342 aa overlap.TBparse score is 0.951"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTVVVAGTRGVGSGAPGFSPDVVVFKELRVLGALGVDATAYRAALDLLVSGRYPFASL
PRRCVRLEGAEDLLATMAGERDGVPPIHGVLTP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LFNPLGAGIRWGYTIPETKPGDVVAVLGPGIRGLCAAAAAKGAGAGGFVMVTGLGPRDA
DRLALAAQFGADLAVDVAIDDPVAALTEQTGGLADVVVDVTAKAPAAFAQAIALARPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RAQCVQLYRRREFTRLDA" 9313. .10416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DPDTCIECPQGSVGEIWVQGGNVASGYWHKPEESKRTFGARIVTESAGTPEAPWLRTG
DSGFVSGGELFIIGRIKDLLIVYGRNHAPDDIEATIQEITSGRCAAIAVPDHGTEKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9499.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRGGEYRRCVRHGLADMYGF I PVDREPGLWGGYAEYQYLAPDSMVLRVAGDLSPEVAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTELKKRGDSDEDVADRLRIVKRDVAAAIFDSHGLSVADLVLVSPGSIPITTSGKIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GMAEATVYIATRNVNEPPEIVDFESEKLPAGQAIRCPSGSGTPLVSYGVPRSQLVRIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <u>AFELAVRKTSDDDMDGLDLAGVHTILNGSERVHPATLKRFAERFGRFNFAAAALRPAY</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /protein_id="CAA17589.1"
/db_xref="GI:2916952"
/db_xref="SPTREMBL:053903"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDHEQYTGELAGGFAFVPGHETVGTIAAIGPRAEQRWGVSAGDRVAVEVFQSCRQCAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /protein_id="CAA17590.1"
/db_xref="GI:2916953"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="adh"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="PS00059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="adh"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="SPTREMBL:053904"
/translation="MSDGAVVRALVLEAPRRLVVRQYRLPRIGDDDALVRVEACGLCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="fadD24"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                       44.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                        Score 400; DB 2
Pred. No. 6e-75;
0; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Zinc-containing alcohol dehydrogenases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2; Length 11042;
                                                                                                                                                                                                                                                                                                                                                                                                                              285;
                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                           15;
                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                       7579
                                                                                                                                                                                      7639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               e.g
                                                                                                                                                                                                                                                                                                                                                                                                                              1;
```

CDS

gene

```
KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20
                                                                                                                                                                                                                                                                                                                                                                       REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                              AUTHORS
                                                                  TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CY19G5
      JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8060
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGAGTACACCCGGCGACCCTCAAACGATTTGCTGAACGGTTCGGCCGCTTTAATTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTCGCACGATTTCGGCACGAATTTCGCTTTCGAATTGGCGGTGCGTAAGACGTCA 8299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCCGAGGGGGGCGTCGTCCCGCCGGACCTCACTGTGGTGTCTTGGCTGCCGCTGTACCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GACGACGACATGGACGGACTTGACCTCGCCGGCGTGCACCATCCTCAACGGCAGCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gacgacgacatggccgggcgtgacctcggcaacatactgaccatcctcagcggtagcgag 825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tttcacgccttttcggcagcaccgaatttcgcctttgaactagcggcacgaagaacaacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACGAGTCCGGTGGGGTTCCTTCAGCGGCCGGCTCGATGGATACAACTGCTGGCACGTAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        accagcccggtgtcgttcctgcagcgcccggcccggtggatgcacttgatggccagcgat 705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GACATGGGTCTTCTATTAGGCGCGATCATGCCGATCCTGGCGGGGTGTACCCACCGTGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gacatgggtttggtaataggaatttgcgcaccaattctgggtggataccccgcggtgctc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gataccgacgggattccaccgcaaattccgcactcgtatcctggctacccttctaccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATGGTCTCGAACAAAATGTCTTCGCCAATTTCGAGCAGATCGTGGCCGACTTCTTTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtgatgtcccatcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tatccatctaccgcgtatttgcaatacacctccgggtccaccccgcacgcccgctggcgtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ctcgatctggacgctccgaa------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtgcaacatgttgcgcggcggcccggggaatccccgccatcaattatcgaagttgatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GTGCTAAGCGACACTTCGCCCGCTGTCATTCTGACGACGTCGGGGGCCGTTGACGATGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CGTATCGCGGTTCCGCTGCCGGTTCCACATGCCGGCGCCCCACGATGAGCGTACGATTTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGAGAATGCGCTCAGCCACAGCCAGGCCAGTCCGCACCATCAATCGTTGAGCTTGATTTG
                                                                                     Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III.C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis H37Rv
277826 AL123456
277826.1 GI:3261623
complete genome sequence
Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria;
                                                           Deciphering the biology of Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium.

1 (bases 1 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                   Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 11430)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complete genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgggtataccttcaaagaagacgag
                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   66/162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7939
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE
REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
                            gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg. gtg. or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with winch?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:1477429.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of positional base preference in codons, especially where there an increase in the observed/expected third position G \,+\, C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             available on the World Wide Web
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Details of M. tuberculosis sequencing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Submitted (11-JUN-1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Notes:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Parkhill,J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Erratum:[[published erratum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      implemented in TBparse (Krogh) supplemented with visual inspection
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12;396(6707):190]]
2 (bases 1 to 11430)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (bases 1 to
                                                                                                                                                                                                                                                                                                                                                                                                                                      ruce="RV1520, (MTCY19G5.08c), len: 346. Probable transferase, similar to e.g. TRO34234 (EMBL:YU7786) SUGAR TRANSFERASE from Vibrio cholerae (337 aa), fasta scores; opt: 214 z-score: 215.5 E(): 8.4e-05, 25.9% identity in 212 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl table=11
/product="hypothetical rprotein_id="CAB01397.1"
/db_xref="GI:1477438"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               If this cannot be identified we choose the most upstream
                                                                                                           /product="hypothetical protein Rv1520"
/product="hypothetical protein Rv1520"
/protein_id="CAB01396.1"
/protein_id="GL1477437"
/db_xref="GL1477437"
/db_xref="SGL15S-PROT:050587"
/db_xref="SGLSS-PROT:050587"
/translation="MSIVSISYNQEEYIREALDGFAAQRTEFPVEVIIADDASTDATP
/translati
                                                        TGRGRNVRGSHA*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="Rv1520"
376. .1416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="SWISS-PROT:Q50588"
/translation="MRCGCLACDGVLCANGPGRPRRPALTCTAVATRTLHSLATNAEL/
VESADLTVTEDICSRIVSLPVHDHMAIADVARVVAPFGEGLARGG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="Rv1519"
81. .350
                                                                                     {\tt HPRMTMLSLQHRWAQTPWRRFKRRLSTELSSLAALAYATRRRALEGRDGGYRETTSPF}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               376. .1416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  similarity to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Rv1519,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="Rv1519"
                                                                                                                                                                                                                                                                                                                                                                                                    transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                             codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     74aa overlap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /clone="Y19G5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /strain="H37Rv"
/db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .11430
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C-terminus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (MTCY19G5.09c), len: 89. Unknown, high rerminus of MTCY78.26, 58.1% identity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           appears
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tuberculosis'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nature 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rv1519'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             is
```

CDS

```
YHDYVRHGEKSDMÄVKKÄLMÄSIGKVITASAATVÄVTELAMVETKLEVESAVOPAIAVA
ITVSLLGAVVTLLPAILTITGRRÖMIK PREDLTSRMWRRSGVRIV BRSTIHLVGSLLIVL
VALAGCTLLI RENYDDLKTVPOHVESVKYEAMNEH PMNAMT PMYLE I KSPEDLRTP
GALADI EMMSREI AELENIVMVRGLTRENGEPLKETKVSFQAGEVGKLDBATTLLEE
HGGELDOLTGGAHQLADALAQIR NEI NIQAVASSSGIVNTLOAMNDLMGGIKTIRQLEN
ASQYVGRMRALGDNLSGTVTDAED IATWASPMVALINGSPVCNISDPACRTSRAQLAAI
VQAODDGLLRSI TRALAVTLQOTOEYQTLARTVSTLAGGLKOVOSTLKAUDGLPTKLAQ
MQQGANALADGSAALAAGVQELVDQVKKMGSGLNEAADFLLGIKRDADKPSMAGFNIP
PQI FSRDEFKKGAQI FLSADGHAARY FVQSALNPATTEAMDQVNDILLTRADSARPNTE
LEDATIGLAGVPTALRDIRDY NISDMKETIVIATIV UFFLILVILLTRADSSARPNTE
LISYLSALGIGTLVFQLI LGQEMHWSLFGLSFILLVALIGADYNMLLISRI RDESPHGI
RIGVIRTVESSTGGVITSAGLI FAASMFCLVGASI NTMAQAGFTIGIGIVLDTELVRIV
RIVDLITTMATCEA MTMIDSEEL GODDGTBDTWA DOWL BENVOLUDEV A JUTCAVEST GUTTVATUR.
/note-"Rv1523, (MTCY19G5.05c), len: 347. Probable methyltransferase, similar tom many although start uncertain, e.g. Streptomycorpicus TR:Q54303 EMBL,X86780 METHYLTRANSFERASE RAPM (317 aa), fasta scores; opt: 323 z-score: 411.4 E(): le-15. 41.2% identity in 136 aa overlap. Also similar to M. leprae G560513 U00020, (270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein (1008 aa) FASTA scores, opt: 2418, z-score: 2571.2, E(): 0, (51.0% identity in 1006 aa overlap), also highly similar toMTCY48.08c, 34.3% identity in 376 aa overlap and some similarity to MTCY20G9.34, 27.2% identity in 1011 aa overlap"

/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="mmpil2"
/note="Rv1522c, (MTCY19G5.06), len: 1146. Strong
similarity to many mycobacterial membrane proteins e.g. M.
leprae TR:049619 6466786 B1170_Cl 181, putative transport
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(3520. .6960)
/gene="mmpL12"
complement(3520. .6960)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="marhdeakagglfdrignfvyrwplivigcwiavaaaltlllpt
LQAQAAKREQAPLPPGAPSMVLQKEMSAAFQEKIETSALLLVLLTNENGLGPADEAVY
RKLIENLRADTQDKISYQDFLAVPEMKELLASKONKAWNLPITFAGDAASPETQAAFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
/product="mmpL12"
/protein_id="Cab01394.1"
/db_xref="GI:1477435"
/db_xref="SPTREMBL:Q50585"
                                                                                                                                                                                                                              /gene="Rv1523"
7001. .8044
                                                                                                                                                                                                                                                                                                                                                             NTNGHASKAATKSVPNGKPADLAEGNGEYLIDHLRRHSLPLEGYAAMPAYDVVDGVSK
PNGDGAHIGKEPVDHLLGHSLPLFGLAGLPSYDRWDDTSIGEPAVGHAGSKPDAKLST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RVAAIVKQTVAGTSLTVHLSGPIATVADLTELGEKDVRIIEIGTAVSVLIILLLVVRN
LVTMLVPLATIGASVVTAQGTLSGLAEFGLAVNMQAIVFMSAVMIGAGTDYAVFLISR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      acyl-coasynthase, simliar to many e.g. 1 (EMBL:U75685) ACYL-COA SYNTHASE from M.
                                                                                                                                                                                                                                                                                                                                                                                                                            TVPALTTMIGRANWWPSELGRDPSTPPTKADRWLRRVKGHRRKAPIPAPKPPHTKVVR
                                                                                                                                                                                                    /gene="Rv1523"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv1521, (MTCY19G5.07), len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             identity in 584 aa overlap."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fatsa scores;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="fadD25"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        opt:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -COA SYNTHASE from M. bovis (582 aa), 2486 z-score: 2167.3 E(): 0, 63.4%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    583.fadD25,
e.g. TR:P71495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Probable
```

CDS

gene CDS

Qγ

dd qd

535

gggattccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggt 594

```
Query Match
Best Local S
Matches 587
                                                                                                                                                                                 2094
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
2214
                                                                                        2154
                                                                                                                                                                                                                                                                               2034
                                                                                                                                                                                                                                                                                                                                                                           1974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1854
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1914
                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg
AATAAGAATCTTTTCGCCAATTTCGAACAAATTATGACCAGTTACTACGGCGTCTATGGC
                          catcagaacgttcgggttaatttcgaacagctgatgtctggctacttttgcggataccgac
                                                                                                                   accgcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcc 474
                                                                                                                                                                                                                                                                                                     cgcatcgccgttgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGAACGCTTAACCTCGCCGCACAGCTAAGAGAACATGGGTCGACCGGCGATCGGGCATTA 1853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cyaacyctyaatytyycacayyayctyagccyttytyytyttccacyyytyaccycytyyty 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GATTACGAGCGGTCCTGGGATGGTGTTGAAGAAACTCTGACGTGGTCGCAGTTATATCGG
                                                                                      CTGGATCTTGATGCTCGGCCGAGCTCCGGTTCTCGTTCTGCCGCTCACGGCCATCCGGAT
                                                                                                                                                                                                                          ctcgatctggacgctccg-----aatgggtataccttcaaagaagacgagtatccatct 414
                                                                                                                                                                                                                                                                          GTCGAATACGTCCAGCCGCAGCCCGGCCAAAACGCACCGGCGGTGATCGAAGTCGATCGG
                                                                                                                                                                                                                                                                                                                                                                      GTGTTCGCCGATACCGCACCGGCGATCGTTCTCACGGCGTCCTCGGTCGTCGACAATGTC
                                                                                                                                                                                                                                                                                                                                                                                                gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATTGTCGCGGTTCCGCTTTCGATTCCCCAGGGTGGTGCCCACGACGAGCGCACCGTTTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATTCTGGCGCCACAAAGCCTCGACTATGTCGTTAGCTTTATTGCCTCGCTGCAGGCCGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       587;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /yeure ...../
/note="Rev1524, (MTCX19G5.04c), reu: ****
/note="Rev1524, (MTCX19G5.04c), reu: ****
/note="Rev1524, (MTCX19G5.04c), reu: ****
transferase, similar to many, e.g. Amycolatopsis
corientalis TR:P96559 (EMBL:U84349) GLYCOSYLTRANSFERASE
GTFB (407 aa), fasta scores; opt: 363 z-score: 541.0 E(
6.2e-23, 28.8% identityin 430 aa overlap, also high
similarity to MTCX19G5.02, 58.7% identity in 416 aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="mtitaltytlpllwrrlttagvkyadoghevgsagvpaadaggr daasegotarwfoctwylvcghepakwafrswctsrscotlpvalryrlosuplvgkl trkflplgatrophrytelpekeepepwalplssedepmrytiptyhoftagydyl greveryeveryever espepwalplssedepmrytiptyhoftagydyn gkveryevesogaagasyiarnucpasytgeldlwpasidlcrakhrlpglopfygcbagu lpfpdesfdavvnveashqypdfrgflævarvlrpgghflytdsrrnpvvaeweaal adapletsisordfaqakrgldantarsoeaigrrapvllaghtrgavrvldwrrthagltrcavrvldwdlrrg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv1524"
8074. .9318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
/trans1_table=11
/product="nypothetical protein
/protein_id="CAB01393.1"
/db_xref="GI:1477433"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GGFSYRIYLFAKD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="hypothetical
/protein_id="CAB01400.
/db_xref="GI:3261624"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aa) FASTA scores,
(60.3% identity i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv1524"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="SPTREMBL:Q50584"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        42.6%;
65.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 385; DB 2;
Pred. No. 8.7e-72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              opt:
n 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                יו protein
יון"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            965, z-score: 1117.8, E(): aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rv1524"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 11430;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
2273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1793
                                             534
                                                                                                                                                                                 2153
                                                                                                                                                                                                                                                                                                                                                                                                                                                               1973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                      2213
                                                                                                                                                                                                                                                                             2093
                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                      2033
                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
```

Ş

Db Db QΥ

g Qy

```
REFERENCE
AUTHORS
TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 8
                                                                                                                                                                                                                                          BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                               COMMENT
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                               KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                        δÃ
                                                                                  멍
                                                                                                       Qy
                                                                                                                                 В
                                                                                                                                                    δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
           Ş
                                  뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              rocus
                                                                                                                                                                              Query Match
Best Local Similarity
Matches 587; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      595
                                                                                                                                 987
                                    867
                                                          121
                                                                                   927
             181
                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAGGTCGCCCGCCAGCACCGTGGTGTCGTGGTTCTATCACGACATGGGT
cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggg
                                                                                   CGAACGCTTAACCTCGCCGCACAGCTAAGAGAACATGGGTCGACCGGCGATCGGGCATTA
                                                                                                cgaacgctgaatgtggcacaggagctgagccgttgtggttgtccacgggtgaccgcgttgtg
                                                                                                                                   GATTACGAGCGGTCCTGGGATGGTGTTGAAGAAACTCTGACGTGGTCGCAGTTATATCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTTACCGCCGCGCGAACTTCGCATTCGATCTGGCGTCTCGTAAGACCAAAGACGAGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tttcggcagcaccgaatttcgcctttgaactagcggcacgaagaacaaccgacgacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtgtcgttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcacgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TTCGTCTTGGGACTGATATTGCCGATTCTGGCTGGCATCCCCGCCGTGCTGACCAGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATTCTGGCGCCACAAAGCCTCGACTATGTCGTTAGCTTTATTGCCTCGCTGCAGGCCGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium tuberculosis sequence
                                                                                                                                                                                                                                                                                                                                                                                   Mycobacterium tuberculosis (clone: y456) ds-DNA.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
Mycobacterium; Mycobacterium tuberculosis complex.
1 (bases 1 to 37316)
                                                                                                                                                                                                                                                                                                                         Submitted (11-OCT-1996)
Beaver Street, Waltham,
GSDB:S:1004723
                                                                                                                                                                                                                                                                                                                                                              Direct Submission
                                                                                                                                                                                                                                                                                                                                                                        Du,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AD000001.1 GI:1702974
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2636
                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                       þ
                                                                                                                                                                                                                                                    /organism="Mycobacterium
/db_xref="taxon:1773"
/clone="y456"
12014 c 11317 g 6759
                                                                                                                                                                                                                                                                                                     1. .37316
                                                                                                                                                                                                                                                                                                             ocation/Qualifiers
                                                                                                                                                                                           42.6%;
                                                                                                                                                                               0;
                                                                                                                                                                               Score 385; DB 2;
Pred. No. 6.2e-72;
0; Mismatches 310
                                                                                                                                                                                                                                                                                                                                     L.Du,
MA, U:
                                                                                                                                                                                                                                                                                                                                      USA,
                                                                                                                                                                                                                                                       6759
                                                                                                                                                                                                                                                                                                                                      Genome Therapeutics | SA, 02154 du@cric.com
                                                                                                                                                                                                                                                                                        tuberculosis'
                                                                                                                                                                                                                                                       r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 from
                                                                                                                                                                                  310;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BCT 03-DEC-1996 clone y456.
                                                                                                                                                                                                      Length
                                                                                                                                                                                  Indels
                                                                                                                                                                                                        37316;
                                                                                                                                                                                                                                                                                                                                                   Corporation,
                                                                                                                                                                                 6;
                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2333
                                                          180
                                                                                   868
                                                                                                           120
                                                                                                                                 928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            894
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          834
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      654
                                                                                                                                                          60
                                                                                                                                                                                  ۲,
                                               REFERENCE
AUTHORS
JOURNAL
REFERENCE
AUTHORS
TITLE
                                                                                                                                                          SOURCE
ORGANISM
                                                                                                                                                                                                                               RESULT
U00010
LOCUS
 REFERENCE
AUTHORS
                                                                                                                                                                                 VERSION
KEYWORDS
                                                                                                                                                                                                        DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Db
                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                      В
                                    JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        807
                                                                                                                                                                                                                                                                                                                 895
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                               835
                                                                                                                                                                                                                                                                                                                                                                                       207
                                                                                                                                                                                                                                                                                                                                                                                                              775
                                                                                                                                                                                                                                                                                                                                                                                                                                     267
                                                                                                                                                                                                                                                                                                                                                                                                                                                             715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     327
                                                                                                                                                                                                                                                                                                                                        147
                                                                                                                                                                                                                                                                                         87
                                                                                                                                                                                                                                                                                                                 aaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gtgtcgttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcacgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           accgcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTGGATCTTGATGCTCGGCCGAGCTCCGGGTTCTCGTTCTGCCGCCTCACGGCCATCCGGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctcgatctggacgctccg-----aatgggtataccttcaaagaagacgagtatccatct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTCGAATACGTCCAGCCGCCAGCCCGGCCAAAACGCACCGGCGGTGATCGAAGTCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtgcaacatgttgcgcggcggcccggggaatccccgccatcaattatcgaagttqatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTGTTCGCCGATACCGCACCGGCGATCGTTCTCACGGCGTCCTCGGTCGTCGACAATGTC
                                                                                                                                                                                                                                                                                                                                                   gccgcgaccaatcaagcgcttcgccgaccgctttgctcgcttcaatctgcaggagagggtg
                                                                                                                                                                                                                                                                                                                                                                                                    ttggtaataggaatttgcgcaccaattctgggtggataccccgcgggtgctcaccagcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AATAAGAATCTTTTCGCCAATTTCGAACAAATTATGACCAGTTACTACGGCGTCTATGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             catcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTGTCGCGGTTCCGCTTTCGATTCCCCAGGGTGCCCACGACGACGAGCGCACCGTTTCCC
                                                                                                                                                                                                                                                                                                                                        CCGGTGACGCTGAAGCGCTTCATCGACCGGTTCGCCCCGTTCAATCTTGACCCCAAGGCG
                                                                                                                                                                                                                                                                                                                                                                                       ATGGAGGGCCTCGATCTCGGTGGCGTACACGGCATCCTCAACGGCAGCGAACGGGTGCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                     TTTACCGCCGCGCGAACTTCGCATTCGATCTGGCGTCTCGTAAGACCAAAGACGAGGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TTCGTCTTGGGACTGATATTGCCGATTCTGGCTGGCATCCCCGCCGTGCTGACCAGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Submitted (01-NOV-1993) Department of School, 200 Longwood Avenue, Boston \mathbf{M}I
                                                                                                               Mycobacterium.
                                                                                                                                                         Mycobacterium leprae.
Mycobacterium leprae
                                                                                                                                                                                                       000010 41171 bp
Mycobacterium leprae
000010
Robison, K.
                                                Direct Submission
                                                          Robison, K.
                                                                     Unpublished 2 (bases 1 to
                                                                                                 Smith
                                                                                                                                                                                             000010.1
                                                                                                                                   Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                               Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                 897
                                                                                                        (bases 1
            (bases
                                                                                                , D. R.
           00 Longwood Avenue,
1 to 41171)
                                                                                                                                                                                             GI:466780
                                                                                                            to 41171)
                                                                                                                                                                                                                                 41171
                                                                                                                                                                                                                    cosmid
                                                                                                                                                                                                                      B1170
                          ¥
                           Genetics,
A 02115
                                                                                                                                               Actinobacteridae;
                                                                                                                                                                                                                                 BCT
                                      Harvard
                                                                                                                                                                                                                                 01-MAR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      474
                                                                                                                                                                                                                                                                                                                                                                                                               834
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            889
```

208 774 268 714 328 654 388 594 534

568

628 360 300

```
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Direct Submission
Submitted (01-MAR-1994) Department of Genetics, Harvard Medical School, 200 Longwood Avenue, Boston MA 02115
On Mar 31, 1994 this sequence version replaced gi:414216.
This sequence data was produced by the Genome Sequencing Center located at Collaborative Research Incorporated (1365 Main St., Waltham MA, 02159). 617-487-7979). Please contact Doug Smith (smith@cr.cric.com). The annotation should be considered
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(7087...7341)
/note="probable ketoacyl synthase (similar to polyketide synthases); Lepb1170_C1_189"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MSQTDASCTIAELPYRSVTDLVVLDFPRPEVALITLNRPGRMNS MALDLAKSLKOVLKRITYDHSVRVVVLTAGARGEGEGGADQKFRAPQVBELTQPVRA LRAMELLEEYLLALRALDPYLAAHNGPAIGGGLCLALAADVRVASTRAYFRAAGING GLSASELGLSYLLPRAVGSSRAFEIMLSGRDVGAEEAEQIGLVSYRVSDDRLLDTCYS
                                                                              /note="mas-associated gene (similar to orf-III_ located 5'
of BCG mas gene; Lepb1170_F1_11"
                                                                                                                                                                                                                                                                                                                                                            /note="mas-associated gene (similar to orf-III located 5'
of BCG mas gene; Lepbl170_Cl_188"
                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="msyffgmggtrvtvdssqssslvavyltcgslrtgasplavlrw
HPSQPGERNRVIEKGVWGIFGVWPHLSVCWALGWICTFTE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               / \texttt{translation-"MLTLLSEPDVLFLDESTNDVDTNTLTATEDFLISWAVTLSRITG} \\ \texttt{YLLHSATEKQLTSIDRPSARLPKPDRDRG"}
/transl_table=11
/product="masC"
                                                                                                                                                                  GTFAQERKDGRVLHGL"
                                                                                                                                                                                                                                                                                                                                                                                                                      complement(8884.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /protein_id="AAA17064.1"
/db_xref="GI:466788"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PHRRRTDLCQCAGHPRFAQPSLPRNRCTSWA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="mRQAWEHQDVDTIVTTTITGFAVPSLDARCAEQLGLRLDVRRMP
LFGLGCVTGQRGLGRLHEDIVWCSQRCRGIGIWSARSPIPRSNQLCRAWCGDGSVRRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /protein_id="AAA17074.1"
/db_xref="GI:466798"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="similar to stilbene synthetase; Lepb1170_C3_257"
/codon_start=1
/transl_table=11
/product="sts"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(3581. .3982)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="rp1"
/protein_id="AAA17079.1"
/db_xref="GI:466803"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="possible regulatory protein or antibiotic
resistance protein; Lepb1170_F3_104"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EKRPTVLVDARGCATSPG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         {	t IAARMATFSRSGTELTKRALWGGLDAASLDKHMQSESLAQLFIALHTSNFEEAAAPCT}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="probable enoy1-CoA hydratase (similar to
Arthrobacter sp. fcbB); Lepb1170_C2_224"
                                                                                                                                                                                                                      /protein_id="AAA17063.1"
/db_xref="GI:466787"
                                                                                                                                                                                                                                                                             /product="masB"
                                                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product-"kas"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /protein_id="AAA17070.1"
/db_xref="GI:466794"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="fcbB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                            translation="MPPELVRNVQGSLIQLRPSQCFADTRPILLVVGEAECFIVWLQA/
                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                organism="Mycobacterium leprae"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      xref="taxon:1769"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .ement(771. .1655)
                                                                                                                                                                                                                                                                                                                                                                                                                         . 9066)
                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
```

```
RNPITMLPLITTIGASLMTAQAVVSGVSVLAGLAVSNOMIVLLSAMIAGAGTDYAVFL
ISRYHDYIRMGSGSADDAGCAVROALISLGKV JAASAATVGITFELGMSETK 18-VESTV
GPALAIGIAVAFLAAVTLMPALLVLAGTGRGVAPRAGAFMRRTGVRIVRRPVAYL
SASMVILTVLALCASLVRENYDDRKOJ PASDESSVGVAALESHEPVGOAIPEYLLIQS
PHDLRTPRALADMAELAQRVSQIPGIALVRGVTRPTGKPLEETSATYQAGMVGKQLGS
ASHLIGESTGDLNRLASGAGLLADKLGDVRIQYGQAVAGISGLLDNLAFAQKMFGDSK
TLGEIDTAGKLVSSMRALGNMFGINFSTTMNDINWGAVVIALISSVLCDTNPICADA
RAQPHKLLTASEDGTLDNIAHLMKQLGSTGSSQTIGATVSGLEKTLTAVUTSLRSIGL
DNPNVMRSKMIGLQNGVNDLASAGRRIADGVAVLVDQTRTMGTSLARASAFLMEMGQD
ASQDSMAGFNVPPQLLNTEDFKKLVQAFISPOGHSVRY TIQTDLNFFSSAAMDQVNTI
LNVATGAQPNTTLSDASIVLSGTTMTTTATVTTAVTATLAR
SIVAPIYLVGSVIVSYLSALGLCVLVPQVLLRQQLHWSVPGLAFVVLVAVGADYNMLL
ASRLRDESSHGLRASVIRTYRSTGGVITAAGLIFAAAMFGLLLSSIATVVQAGFVLGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="MHPGGAIGGELIESRLGDIVTRWPWVVIGCWTLLALMLPMTVPS
LTELTORHPVVILPVDAPSSVAAKKISQAFHEVDSENVLIVLLTDDKGIGFAABETVYK
TLVDRLRNDTROVVLLOBFLSTPPLHELLVSKOKKANILPTVLAGELGTSASVQAYAG
VAGIVKQTLESTAGSSLKANLTGPASTVADLTDAGARDRTSIELVIAVLLLTILMIIY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGDYIPLIDYTMPQRMDSQYDSNRVVAAYDGLSEFPDRADNLLAQLNCFAGGAISHTP SGFFNPEDVPPQNIRTTVNISGAKTTTYLIPVHHLPLTLPLRYLGWSDALVDQIDAVL QPKIDAAYAYNDNPLNKPISVDPVNGMDPIAGIDAELRDSILNVFAQLRSILPPPPPG complement (13018. .16044) /note="tpl: Lepb1170_C1_181"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="MLASRIGAIAARKSLPSIGCIAPTGYSENKNNEMKRLLATTLAA
LTVGTVSGFGSTVASSEPGEPMLPPSPVPVRENSPAKIVYALGGARPPTFDWDYYTIT
AGDEFFPDVMRKLIDVPARAPFRVPUPFLVPGPRDEVTIGEAIA/VATKKHUQAIHGF
EPAAVVGLSGSLALDTEQEQLATDPTAPPPDQLTFNTFGDPSGYHGFGKSVLASIFR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="mrivdsdtciecptgrvgeiwlhgdnvaegywhkpeetortegg
KLANPSPGTPECPWLRTGDLGFISEDELFIVGRMKDLLIVYGRNHYPEDIESTVQEIT
GGRVAAISVPVDETEKLVTIIEVKKRGDSDAEAMQKLVAVKNNITAAISKSHGLNVAD
LOCEPGSIPTTSGKVRRTACVEQYRRQQFSRLDG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         transport protein actII-3 from S.coelicolor)"
/protein_id="AAA17062.1"
/db_xref="GI:466786"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="Lepb1170_F3_112"
/protein_id="AAA17081.1"
/db_xref="GI:466805"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VDSASGPPKPSKWAPRPLARLLNGDSLWVAGVAGLGIALPSVDYLAALAVILTSGAAA
TTQVGALLMFNVVAFALIEIPLAAYLLAPDTTRAWTAALNNWIRSRRRLEVATLLAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="probable CoA ligase; similar to potato
4-coumarate--CoA ligase; Lepbil70_F3_111"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FYHDMGLVLGVVAPILGGWRSELTSPISFLQRPARWIQAMATSSHPFSAGPNFAFELA
ARRTSDADIAGLDLGACQGIISGSERIHPATLNRFSDRFARINFRDDMMLPSYGLAEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RVGAVLADTSPSVVLTTSAVADA I AKYVDHSDTDTVPA I LEVDSPNLDVENKSNI RLT
DAPSTAYLQYTSGSTRLPTGVMVTHRNLMVNFQQLMADY FAPTNGVAPLDLTI VSWLP
                                                                                   GILLDTFIVRTITVPAVAALLRRASWWPARPWGNNA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11415.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SCLLLAVGIAGL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /translation="MWITILLMAIAISLEPERIGMTVLMLNRPRPTLQLLVFLCSGFT
MGMTVGFVVLFVFRRRLMASMQLTLPKVQILIGVLALLVAAVLTVQVCISSEPPAESP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
/product="Lepb1170_F2_64"
/protein_id="AAA17078.1"
/db_xref="GI:466802"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="mQNSSVLSFLRERAGLQPDDEAFSFTDYEQDWAGVRKTLTWAQL
YQRTLNVAHELRRHGSIRDRAVILAPQGLDYIIAFLGAMQAGFIAVPLSVPQAGSHDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10658. .11350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="pclA"
/protein_id="AAA17080.1"
/db_xref="GI:466804"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10038
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TVYAASALREARQRSFISNREAVGRHRETAKHGPARHC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'product="transport protein (similarity to antibiotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /protein_id="AAA17075.1"
/db_xref="GI:466799"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .12590
match to surfactin synthase; Lepb1170_C1_180"
```

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8971
                                                     481
                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
aacgttcgggttaatttcgaacagctgatgtctggctacttttgcggataccgacgggatt 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cycatcyccytyccyctttcygttccacaayyccycttaccyattyaacyttccyattcy 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcagggcggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGAACCTTGAACGTTGCGCACGAGCTCAGGCGGCACGGTTCGATAAGAGACCGGGCAGTG
                                                                                                                                         TACTTACAGTACACCTCGGGTTCGACCCGCCTTCCAACCGGGGTCATGGTCACGCACCGG
                                                                                                                                                                                                                            tatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatcag
                                                                                                                                                                                                                                                                                                                                        CCAAATCTAGACGTCGAGAATAAATCGAATATTAGACTCACCGATGCGCCGAGCACAGCG
                                                                                                                                                                                                                                                                                                                                                                                                                       ctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCGAAATACGTTGACCACTCTGACACCGACACCGTCCCGGCGATCCTCGAAGTCGACTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 graceacatgracegegegegeceggggaatccccgccatcaattatcgaagttgatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTGCTTGCCGACACATCACCCTCGGTCGTCCTGACAACGTCTGCGGTTGCCGATGCGATC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTTATCGCCGTTCCGCTGTCAGTACCTCAGGCCGGCTCCCATGACGAACGTGTCGGAGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATATTGGCTCCCCAGGGGCTGGACTATATCATCGCGTTCCTGGGAGCTATGCAGGCTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GACTACGAGCAGGATTGGGCGGGTGTCCGCAAAACACTGACTTGGGCGCAGCTGTATCAA 9030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
/product="masA"
/protein_id="naA17069.1"
/protein_id="AAA17069.1"
/protein_id="AAA17069.1"
/protein_id="RAAA17069.1"
/db_xref="GI:466793"
/db_xref="GI:466793"
/translation="MRAANVTPVAVIGMACRLPGGIDSPQRLWEALLRGDDLVTEIPK
/translation="MRAANVTPVAVIGMACRLPGGIDSPQRLWEALLRGDDLVTEIPK
/translation="MRAANVTPVAVIGMACRLPGGYEDCFFGWTEREALAIDPQGHRLLLET
SWDAIEHAGLDPATLAGSATCVEVGLTHGDYELLSADGGATEGPYGFTGTSNSFASGR
VAYTLGLHGPAVTVDTACSSGLMAVHQARGSLDCGESDLALAGGVVVTLEPRKSVSGS
LQGMLSFTGRCHAFDVAADGFVSGEGCVVLLLKRMPDAERBGDRTLAVLRGTAANVGG
HTVHIAAPSEQAQIAVYHKAALAVGGVDPTTVGLIEAHGTGTPVGDPIEVASLAAVYGT
AGRCALASTKTNFGHMQSTSGFUGMMKAILALQHGVPKKUHFTRLDDQLABITTELF
VPQVNTPWPVDVQQPRRAAVSSYGMSGTNVHAILEQAPRNSGKOSFAVSKVNGFLLFP
VPQVNTPWPVDVQQPRRAAVSSYGMSGTNVHAILEQAPRNSGKOSFAVSKVNGFLLFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="sus"
/product="sus"
/protein_id="Asal7061.1"
/protein_id="Asal7061.1"
/protein_id="Asal7061.1"
/db_xref=="Ci:466785"
/translation="MQVGPLTLGTLLDWAPRAGKTISWOPTPATCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLLDWAPRAGKTISWOPTPATCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLLDWAPRAGKTISWOPTPATCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLLDWAPRAGKTISWOPTPATCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLGTLANAVCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLANAVCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLGTLANAVCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLANAVCEKVSQAPVSSVPV
/translation="MQVGPLTLGTLANAVCEKVS"
/translation="MQVGPLTLGTLANAVCEKVS"
/translation="MQVGPLTLGTLANAVCEKVS"
/translation="MQVGPLTLGTLANAVCEKVS"
/translation="MQVGPLTLGTLANAVCEKVS"
/translation="MQVGPLTLGTLANAVCEKVS"
/t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DVVLAVVASPTSTVVGGDTQAIRHLLAAWQAQDVMVREVAVDVASHTPQVEPILDDLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LSATSVEOLRATAARMADWVDEHGSGTKHTGLWDLGYTLSRRRGYRPVRTMVLASSFA
ELSRGLREIAGSEIPYGSAVGDDRGPVWVFSGGGSOWAGMGAELFAKEPVFBAAIAA
MEPVIVEESGFSVTEALTVAEKVFGLDRVQPTIFAIDVALAAMMKSYGYYPGAVIGHS
LGEAAAAVAAGALSCEDGLRVICRRSQLMSRVAGSGAMASVELPGQQVLSELSIRGLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(17547.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TVPIAGSSFGDAARAAQNCFDTDVHLAEVPYDRVVELAPTVHKPRPNFPVINFLDAGT
APLSVLLTAGLDGLNIGVYSDGRYSYQMSIYVIRVEQETAVAVMFPDNPEAQESVARY
LETLKSVFECVAESGHWRNVA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AACTVAGARFVGGVLACCGLAEYELTGADTYYGLTPRDTRRIPTDVLTQGWFTGLVPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="mycocerosic acid synthase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          41.2%;
63.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 371.8;
Pred. No. 3.7e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .23903)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3.7e-69;
ches 322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lepb1170_C2_209"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 41171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9210
                                                                                                                                              9450
                                                                                                                                                                                                                                                                                                                                   9390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
```

ρ 2 Дy

0y

positional base preference in codons, especially where there

```
ACCESSION
                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Locus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MTV005/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9811 ACGCTAAATCGGTTCTCGGATCGGTTTGCCCGAATCAATTTCCGCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9451 AACCTTATGGTGAATTTCCAACAGTTGATGGCTGACTACTTCGCTCCCACTAACGGTGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acgatcaagcgcttcgccgaccgctttgctcgcttcaatctgcagga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcacgccttttcg 720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ataggaatttgcgcaccaattctgggtggataccccgcggtgtctcaccagcccggtgtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggttttggta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGCCTCGATCTCGGCGCTTGCCAGGGCATCATCAGCGGCAGTGAACGAATCCACCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCGCCACTCGATCTCACCATCGTGTCGTGGCTGCCGTTCTACCACGATATGGGCTTGGTT 9570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium; Mycobacterium tuberculosis complex.

1 (bases 1 to 37840)

1 (bases 1 to 37840)

Cole,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C.,
Harris,D., Gordon,S.V., Eiglmeier,K., Gas,S., Barry III,C.E.,
Tekaia,F., Badcock,K., Basham,D., Brown,D., Chillingworth,T.,
Tekaia,F., Davies,R., Devlin,K., Feltwell,T., Gentley,S.,
Hamlin,N., Holroyd,S., Hornsby,T., Jagels,K., Krogh,A., McLean,J.,
Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A.,
Rajandream,M.A., Rogers,J., Rutter,S., Seegers,K., Skelton,S.,
Grance B., Grance B., Children, T., Taylor, K., Skelton,S.,
Grance B., Grance B., Children, T., Taylor, K., Skelton,S.,
Grance B., Grance B., Children, T., Taylor, K., Skelton,S.,
Grance B., Grance B., Grance B., Grance C., Children, T., Grander, K., Skelton,S.,
Grance B., Grance B., Grance B., Grance C., Grance C., Children, T., Grander, K., Skelton,S.,
Grance C., Grance B., Grance B., Grance C., 
                                                                                                                                                                                                                                                                               Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhillesanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2695948.
been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection
                                                                                                                                                                                 Details of M. tuberculosis sequencing at the available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Erratum:[[published erratum 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complete genome sequence
Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Squares, S., Sqares, R., Sulston, J.E., Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium tuberculosis. Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis H37Rv complete genome; segment 51/162. AL010186 AL123456 AL010186.1 GI:3261493
                                                                                                            (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Parkhill,J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Deciphering the biology of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MTV005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (bases 1 to 37840)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   37840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   dq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          appears
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Taylor, K., Whitehead,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tuberculosis from the
                                                                                                                                                                                                                 Sanger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1998 NOV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9857
                                                                                                                                                                                                                     Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
```

```
FEATURES
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 misc_teature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein, almost identical in part to M. tuberculosis gene fragment TR.62384665 (EMBL:AF009358) ORFAZ-898 (FRAGMENT) (59aa)(93.9% identity in 49 aa overlap) (Nano F.E., Doran J.L., Treit J.D., Moran A.J.; Identification of Mycobacteriumtuberculosis peptides that stimulate immune human peripheral blood monocytes; Unpublished). Contains possible N-terminalsignal sequence and appropriately positioned PS00013 Prokaryotic membrane lipoprotein lipid attachment site. Alsocontains"
                                                                                                                                                                                                                                                                                                                       Complement(2005. .2610)

/gene="Rv1167c,"
/note="Rv1167c," (MTV005.03c), len: 301. Probable
transcriptional regulator, similar to several eg.
TR:D1022772 (EMBL:D85417) hemR from Propionibacterium
freudenreichii (243 aa), fasta scores; opt: 268 z-score:
416.1 E(): 5.4e-16, 35.9%identity in 198 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PVTGGGFRVENIDPORDEILIJARNDRYWGPPSKPGIILFRRAGAPAALADSVRNGDTO
VAQVHGGSAAFAQLSA IPDVRTARIVTFRAVMOFTIRANVPKLADTOVRKA ILGLDVD
LLAAVGAGTDNIVTLDOAQIRSPSDPGYVPTAPPAMSSAAALGILEASGGPQVDTNYSV
SPAPSVPDSTTTSVSTGPPEVIRGRISKDGEQLTLVIGVAANDPTSVAVANTAADQLR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="
70. .19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="fragment designated v005. Does not represent a
physical clone"
70. .1977
                        GKTALPSMEIVSQLLHEPELRAIFINSVWAPRLRIVESILQAGVRSGEIDPATLTPMTARIGPALIHQHVLFTGSPPDREQLTRIIDAMILTTGERRES"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(2005. .2610)
/gene="Rv1167c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DVGIAATVLALDPVTLYHDALNDNRVDAIVGWRQAGGNLATLLASRYGCPALQATTVP
AANAPTTAPSAPIGPTPSAAPDTATPPPTAPRRPSDPGALVKAPSNLTGICDRSIQSN
complement(2682.
                                                                                    AARAQTGKAALYRRWAGKRELVLAAVQYALPPVPEPRADRSARENLLAVFTANCEILA
                                                                                                                                                                           /transl_table=11
/product="hypothetical protein Rv1167c"
/protein_id="CAA15844.1"
/db_xref="GI:2695951"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          attachment site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDAGQWVKTGQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
/product="lpqw"
/protein_id="CAA15843.1"
/db_xref="GI:2695950"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="lpqw"
/note="Rv1166, (MTV005.02), len: 670. Possible membrane
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="Mycobacterium tuberculosis"
/strain="H37Rv"
                                                                                                                /db_xref="SPTREMBL:050423"
/translation="MTVSAPAKANPYRRRGEVLERALYDATLAELESAGYGGLTMEGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IDAALNGTKNINDVITAVEPRLWNMSTVLPILQDTTIVAAGPSVQNVSLSGAVPVGIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /db_xref="SPTREMBL:050422"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="PS00013 Prokaryotic membrane lipoprotein lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1977
.1977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pqW"
```

```
Streptomyces lincolnensis lmbE gene TR:Q54358 (EMBL:79146) from Lincomycin production gene cluster (270 aa), fasta scores; opt: 308 z-score: 409.5 E(): 1.2e-15, 32.0% identity in 278aaoverlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Rv1169c, (MTV005.05c), len: 100. similar to the /note="Rv1169c, (MTV005.05c), len: 100. similar to the n-terminal region of the M. tuberculosis PE family of proteinseg. TR:005297 (EMBL:29377) MTC1364.07 (9) aa), fasta scores; opt: 209 z-score: 407.6 E(): 1.6e-15, 37.48 identityin 99 aa overlap. Also simlar to the N-terminus of M. tuberculosis TR:P77909 (EMBL:U76006) ESTERASE/LIPASE (EC 3.1.1.3) (TRIACYLGIYCEROL LIPASE) (437 aa), fasta scores; opt: 193z-score: 381.8 E(): 4.4e-14, 37.28 identity in 94 aa overlap. Contains a helix-turn-heix motiffrom aa 88-109(+2.76 SD)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(3740. .4042)
/gene="PE"
complement(3740. .4042)
/gene="PE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEINGLITSWRGPSSTIMAAAVAPFRAWIVTTASLAELVADHISVVAGAYEAAHAAHV
PLPVIETNRLTRLALATTNIFGIHTPAIFALDALYAQYWSQDGEAMNLYATMAAAAAR
LTPFSSPPAPIANPGALARLYELIGSVSETVGSFAAPATKNLPSKLWTLLTKGTYPLTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="PPE"
/gene="PPE"
/gene="Rv1168c, (MTV005.04c), len: 346. Member of the M.
/note="Rv1168c, (MTV005.04c), len: 346. Member of the M.
tuberculosis PPE-family, similar to many eg. TR:E332789
(EMBL:298268) MTC1125.27C (385 aa), fasta scores; opt: 5.
z-score: 780.2 E(): 0, 36.6% identity in 388 aa overlap"
                                                                                                                                                                                                                               /gene="Rv1171"
5303. .5665
                                                                                                                                                                                                                                                                                                                                                                                                                               EGEVIGDRWAQLTADHADQLGGYRIGELTAALRALGVSAPIYLGGAGRWRDSGMAGTD
QRSQRRFVDADPRQTVGALVAIIRELRPHVVVTYDPNGGYGHPDHVHTHTVTTAAVAA
                                                                                                                                                5303. .5665
/gene="Rv1171"
/note="Rv1171, (MTV005.07), len: 120. Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product-"hypothetical protein Rv1170"
/protein_id="CAA15847.1"
/db_xref-"G1:269594"
/db_xref-"SPTREMBL:050426"
/translation="MSETPRLLEVHAHPDDESLSNGATIAHYTSRGAQVHVVTCTLGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="Rv1170"
4222. .5133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="possible RBS upstream of Rv1169c"
4222. .5133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MSFVTTRPDSIGETAANLHEIGVTMSAHDDGVTPLITNVESPAHDLVSJVTSKLFSMHELYKAJARQAHVIHESFVQTLQTSKTSYWLTELANRAGTST"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DTIGGLSVPPSWYADKSITPLAKAVPTSAPGGPSGTSWAQLGLASLAGGAVGAVAART
RSGVILRSPAAG"
                                                                                                                                                                                                                                                                                                                                  GGSAGARDERGWETDLLAGLGFTASGT'
                                                                                                                                                                                                                                                                                                                                                                     SDDGIDAVVEADEQARAAKVAALAAHATQVVVGPTGRAAALSNNLALPILADEHYVLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(4051.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="CAA15846.1"
/db_xref="GI:2695953"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="PE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ARISSIPVEYVLAFVEGSNMGQMMGNLAMRSLTPTLKGPLELLPNAVRPAVSATLGNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /protein_id="CAA15845.1"
/db_xref="GI:2095952"
/db_xref="SPTRMBL:050424"
/translation="MDFTIFPPEFNSLNIQGSARPFLVAANAWKNLSNELSYAASRFE
/product="hypothetical protein Rv1171"
/protein_id="CAA15848.1"
                                                                                                                                  hydrophobicprotein"
                                                                                                                                                                                                                                                                                                                                                                                                    AGVGSGTADHPGDPWTVPKFYWTVLGLSALISGARALVPDDLRPEWVLPRADEIAFGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Rv1170,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4222. .5133
/gene="Rv1170"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SPTREMBL:050425"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /transl_table=11
/product="PPE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                 transl_table=11/
                                                                                                       codon_start=1/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (MTV005.06),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .4056)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      303. similar to
```

CDS

gene

gene CDS

RBS

CDS

gene

밁 δÃ

30459

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                            30635
                                                                                                                                                                                                                                                                                                                                            30755
                                                                                                                                                                                                                                                                                                                                                                                                                                 30815
                                                                                                                                                                                                                                                      30695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       31052
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       31232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  31352 GACTACGAACAGGATTGGGCCGGCATCACCGAAACGCTCACGTGGTCAGAGGTGTTTCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          30935 TACTTGCAGTACACCTCTGGCTCCACCCGCGCTCCGGCTGGGGTCATGATCTCGCATCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            31112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
acgatcaagcgcttcgccgaccgctttgctcgcttccaatctgcaggagagggtgaaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggtttggta
                                                                  GGCCTCGACCTCGGCAACGTCCTGGGCATCACCAGTGGTGCTGAACGAGTCCACCCCAAC 30516
                                                                                              GCCGCACCGAATTTCGCCTTCGAATTGGCCGTCCGCAAGACAACAGATGCCGACATAGAA
                                                                                                                                                                                 gcagcaccgaatttcgcctttgaactagcggcacgaagaacaaccgacgacgacgacatggcc
                                                                                                                                                                                                                                                    TTCCTGCAACGGCCAGCGCGTTGGCTACATTCGCTGGCCAACGGAAGTCCTTCGTGGTCG
                                                                                                                                                                                                                                                                           ttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcacgccttttcg
                                                                                                                                                                                                                                                                                                                                            CTTGGCATCATCGCACCGATCCTGGGCGGCTACCGCAGTGAACTCACTAGCCCGCTGGCG
                                                                                                                                                                                                                                                                                                                                                                                   ataggaatttgcgcaccaattctgggtggataccccgcggtgctcaccagcccggtgtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                 GCGCCACCTGACCACCATCGTGTCGTGGCTGCCGTTCTACCACGACATGGGCTTGGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacgggatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTGGACTTGACCG----GGAATTCACCGAGCTTTCGGGTGAAGGATCTGCCAAGCGCCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCGAGCACATCCACCGGCCGAACACGAACGTAGGGCCGATCATCGAAATCGATTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gtgcaacatgttgcgcggccgggcccggggaatccccgccatcaattatcgaagttgatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgcatcgccgtgccgctttccggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgaacgctgaatgtggcacaggagctgagccgttgtgggttccacggggtgaccgcgtggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AACCTTCAGGCGAATTTCCAACAGCTGATGTCGAACTACTTCGGCGACCGCAACGGTGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTGCTTGCCGACGCGTCACCTTCGGTCATCCTGACAACATCTGCGGTCGCAGAAGCGGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCGATAGCGGTTCCGTTGTCAGTCCCGCAGATCGGCTCTCACGACGAACGTGTCAGCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTCTGGCTCCGCAGGGCCTGGCCTACATCGCGGCCTTTCCTAGGTTCGATGCAGGCCGGA 31173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGGACCCGCATCGTTGCTCACGAAGTCAGGCGGCATTGCACGACCGGAGACCGAGCCGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         573;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(5673. .6599)
/gene="PE"
/note="Rv1172c, (MTV005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(5673. .6599)
/gene="PE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="mvvlallIvdgvvsalagallmpwrigsapepisalisglvnaa
LvwaaarwTTSSRvaalplwawLLTvaamSFGGPGDDvILGGQGLLvygalvFvvaga
vPPAWvLwRRRvQaDGSG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="GI:2695955"
/db_xref="SPTREMBL:050427"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              40.7%;
63.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 367.4; DB 2 Pred. No. 3.2e-68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches 321;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (MTV005.08c),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 308.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N-terminus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     37840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω
--
                                                                                                                                                            30576
                                                                                                                                                                                                        780
                                                                                                                                                                                                                                                                                              720
                                                                                                                                                                                                                                                                                                                                          30696
                                                                                                                                                                                                                                                                                                                                                                                     660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30816
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          30876
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    31293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                    30636
                                                                                                                                                                                                                                                                                                                                                                                                                                 30756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  31113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30515 ACGCTCAGTAGATTCTGCAACCGGTTTGCACCGTACAATTTCCGCGAAGACATGATA
```

₽ õ В δÃ 밁 Š 밁 Š ₽ Ş 뫄 Ş

Ş 밁 Ωy 밁 δÃ 맑 δÃ В δõ 망 δõ

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LOCUS
DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MTCY349/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E., Harris, D., Bodcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitchead, S. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CBIO 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhillesanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:1694844.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (11-JUN-1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Details of M. tuberculosis sequencing at the Sanger Centre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Erratum:[[published erratum appears 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis
Z83018 AL123456
Z83018.1 GI:3261671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Parkhill,J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Barrell,B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MTCY349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (bases 1 to 43523)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 43523)
mycobacterial enzymes believed to be involved in polyketide or fatty acid synthesis such as 6466799 MASC. FASTA best: Y06J_MYCTU 010976 hypothetical 67.9 kd protein cy338.19, (626 aa), fasta scores, opt: 2417, E(): 0, (60.4% identity in 618 aa overlap), identical to G560511
                                                                                                                                                                          complement(26. .1885)
/gene="fadD29"
/note="Rv2950c, (MTCY349.40), len:
                                                                                                                                                                                                                                                                            /gene="fadD29"
                                                                                                                                                    Probable Acyl-CoA Synthetas,
                                                                                                                                                                                                                                                                                                                                           /db_xref="taxon:1773"
/clone="Y349"
                                                                                                                                                                                                                                                                                                                                                                                                        /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1. .43523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        43523 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted on behalf of the Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H37Rv complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in
                                                                                                                                                       similar to various
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        genome;
                                                                                                                                                                                       619 aa.fadD29,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           segment 131/162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17 - JUN - 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        are
```

```
/note="possible RBS, AAG
complement(2533..3678)
/gene="Rv2951c"
complement(2533..3678)
/gene="Rv2951c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="Rv2952, (MTCY349.38), len: 270 aa. Probable glycosyltransferase, identical to G560513 U00020, Very similar to C-terminal part of putative M. tuberculosis protein MTCY19G5.05C. (358 aa) FASTA score: opt: 965 E(): 0; 60.3% identity in 247 aa overlap. Some similarity to methyltransferases e.g. METHYLTRANSFERASE (317 aa) opt: 315; E(): 9e-15; 40.7% identity in 135 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Rv2951c, (MTCY349.39), len: 381 aa, similar to putative oxidoreductases MTCT5.06c and MTCY22G10.03identical from 39987 with G560512 U0002P from TBC2. Similar to E64491 N5,N10-methylene tetrahydromethanopterin reductase (342 aa) FASTA score: opt: 372 E(): 4.6e-17; 30.8% identity in 295 aa overlap.'
/note="Rv2953, (MTCY349.37c), len: 418 aa. Unknown but very similar to AL021246|MTV008_5 Mycobacterium tuberculosis sequen (419 aa) opt: 1835 z-score: 2201.2 E(): 0; 67.5% identity in 419 aa overlap; nearly
                                                                                                                                                                                                                                                                                                                                               /translation="mafsrthsllaragststykrvwrywyplmtrglgndeivfinw
/translation="mafsrthsllaragststykrvwrywyplmtrglgndeivfinw
ayeedppmdlpleasdepnrahinlyhrtatqvdlggkqvlevscghgggasyltrtl
hpasytgldlnqagiklckkrhrlpgldfvrgdaenlpfddesfdvvlnveashcyph
frrflaevvrvlrpggyfpyadlrpnneiaaweadlaatplrglsqrqinaevlrgig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="Rv2952"
3871. .4683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGELISRESPYFPLHNALFDLPPYRGKWPEIWVAAHGPRMLRATGRYADAWIPIVVVR PSDYSRALEAVWSAASDAGRDPMSITPAAVRGIITGRANDDVERALESVVVKMTALGV PGEAMARHGVEHPMGADFSGVQDIIPQTMDKQTVLSYAAKVPAALMKEVVFSGTPDEV IDQVAEWRDHGLRYVVLINGSLVNPSLRKTVTAVLPHAKVLRGLKKL" 3871. 4683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="MGGLRFGFVDALVHSRLPPTLPARSSMAAATVMGADSYWVGDHL
NALVPRSIATSEYLGIAAKFVPKIDANYEPWTMLGNLAFGLPSRLRLGVCVTDAGRRN
PAVTAQAAATLHLLTRGRAILGIGVGEREGNEPYGVEWTKPVARFEEALATIRALWNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="hypothetical protein
/protein_id="CAB05425.1"
/db_xref="G1:1694883"
/db_xref="SPTREMBL:P95140"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                opt: 372 E(): 4
/codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QLSVGQAKRAENGSEGANLVSYGAPRASTVRIVDPETRMENPAGTVGEIWVQGDNVGL
GYWRNPQQTEATFRARLVTPSPGTSEGPWLRTGDLGVIFEGELFITGRIKELLVVDGA
NHYPEDIEATIQEITGGRVVAIAVPDDRTEKLVTIIELMKRGRTDEEEKNRLRTVKRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DLLQKAASQYPNRAAYKFIDYDTDPAGFTETVTWWQVHRRAMIVAEELWIYASSGDRV
AILAPQGLEYIIAFMGVLQAGLIAVPLPVPQPGIHDERISSALGSDSAPSIITTSSVI
DEVTTYAPHACAAQGQSAPIVVAVDALDLSSSRALDPTRERESTAYLQYTSGSTRAY
DEVTTYAPHACAAQGCSAPIVVAVDALDLSSSRALDPTRERESTAYLQYTSGSTRAY
AGVULSHKNVITNCVQLMSDYIGDSERVPSTPVSWLPFYHDMGLMLGIILPMINQDTA
VLMSPMAFLQRPARWMQLLAKHRAQISSAPNFGFELAVRRTSDDDMAGLDLGHYRTIV
TGAEEYNVATLRFTERFAPFNLSETAIRFSYGLAEATVYVATAGPGRAPKSYCFDYQ
                                                                                                                                                                                                                                                                                                                   NNSQKSRDLVDRHLPAFLRFAGREFIGVQGTQLSRYLEGGELSYRMYCFTKD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="hypothetical protein Rv2952"
/protein_id="CAB05424.1"
/db_xref="GI:1694882"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(1891.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VASAISRSHRLRVADVVMVAPGSIPVTTSGKVRRSASVERYLHHEFSRLDAMA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /trans1_table=11
/product="fadD29"
/protein_id="CAB05426.1"
/db_xref="GI:1694884"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="SPTREMBL;P95141"
/translation="MKTNSSFHAAGEVATQPAWGTGEQAAQPLNGSTSRFAMSESSLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="Rv2952"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="SPTREMBL:Q50464"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
                                                                                                                                                                                                                                                                                  5965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ,1895
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAGGA, for Rv2950c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rv2951c"
```

gene

CDS

gene RBS

gene

CDS

gene

CDS

CDS gene

δÃ 뭥 δÃ Ъ Ωy

121

atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcaggccggg 180 CGAGCGATGATCGTGGCAGAGGAGCTCTGGATATACGCGTCAAGCGGTGATCGGGTCGCG 1577 cgaacgctgaatgtggcacaggagctgagccgttgtggttccacgggtgaccgcgtggtg 120 GACTATGACACGGATCCGGCTGGCTTCACCGAAACCGTGACGTGGTGGCAAGTCCACCGG 1637 Matches

1696

61

```
Local.
Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="Rv2954c, (MTCY349.36), len: 241 aa, unknown, identical to G560516 U0002, clone TBCC2. Some similarity splp76291/FBCP_ECOLI HYDOTHETICAL 37.0 KD PROTEIN IN A (323 aa) fasta scores, opt: 149 z-score: 191.7 E(): 0.0038; 25.4% identity in 185 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             identical to putative M. tuberculosis proteins (difference due to probable frameshift in TBC2) G560514 U0002N, G560515 U0002M. Similarity to hypothetical protein S75052 sll1601 - Synechocystis sp. (PCC 6803) P73855 HYPOTHETICAL 44.8 KD PROTEIN (414 aa)opt: 565; E(): 4.1e-30; 35.5% identity in 408 aa overlap"
                                                                                                                                                                                                                                  /translation="mgpqDvrlmrvvvcrrlGpakGqRrwrplDlGTTGCFENLGAQR
PTYRWARIRWLECAMENRLVRSLQRWRPEGLEPHRWRLAPWYRMGLQVTLEPGSAIAW
IVRLTGGFEETEIDIAAALYSALYBDRCILDVGANVGIHSLAWARLAPVYALEPAPGT
HSRLEANVAANGLQDRIRTLRTAAGDAVGEVDFFVAADSAFSSLNDTGRIRIRERTRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Rv2955c, (MTCY349.34), len: 321 aa. Unknown but some similarity to AC003105[AFAC003105_5 Arabidopsis thailana (319 aa) fasta scores, opt: 177 z-score: 223.8 E(): 6.1e-05; 27.4% identity in 226 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(7010. .7975)
/gene="Rv2955c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VASRAPLNLPTLVEELPMVQRRC"
complement(7010..7975)
/gene="Rv2955c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EVGAG IGDHTQFFLDRGCKVLCTEPRGENLDVIRQRFGSNPNVTVDHLDLDGDLPAEA
HQYDVVYCYGVLYHLSRPAEALAWMCDRAVDLLLLETCVSYSGEDEPFLVSERASSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="hypothetical pro
/protein_id="CAB05422.1"
/db_xref="GI:1694880"
/db_xref="SPTREMBL:Q50461"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(6096. .6821)
/gene="Rv2954c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(6096. .6821)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EPELGAQPDFLRRPGRDLAPELAGFWTGGFVQAPFNTRIVRRSNALQEWAYGRRFRYS
ETMSLGKSMAAPILAAAVTGTVAGTIGLGNKYFDRLPRRLVERVTPKFGTGPSRKTQE
RGHYTFETYTTTTTGARYRATFAHNUDAYKSTAVLLAQSGLALALDRDRLAELRGVLT
PAAAMGDALLARLPGAGVVMGTTRLS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="MSPAEREFDIVLYGATGFSGKLTAEHLAHSGSTARIALAGKSSE
/translation="MSPAEREFDIVLYGATGFSGKLTAEHLAHSGSTARIALAGKSSE
RLGGVRMMLGPNAADMPLILADASQPLTLEAMAARAQVVLTTVGPYTRYGLPLVAACA
KAGTDYADLTGELMFCRMSIDLYHGQADTGATILAGGFSIPSIPSDLMYYQLVRRSVE
DGTGELCDTDLVLRSFSQRMVSGGSVATYSEAMRTASSDPEARRLVTDPYTLTTDRGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="hypothetical protein
/protein_id="CAB05423.1"
/db_xref="GI:1694881"
                                                                                                                                                                                                                                                                                                                                                                                  /product="hypothetical protein Rv2955c"
/protein_id="CAB05421.1"
/db_xref="GI:1694878"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QAITGTGCRPSRVWVMNRLREKMPHVYVTATQPRHRQFPLDWRANGPIASTGLARAVF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="Rv2954c"
                                                                                                                                                                                                         PCTTLDALAAELPLPVGLLKIDVEGLERAVIAGAAELLRRDRPVLLVEIYGGAASNPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="MRLPGMLRPTAERHFHSIFYLRHNARRQEHLATLGLDLGNKSVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="SPTREMBL:p95139"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                         /db_xref="SPTREMBL:P95137"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          codon_start=1
                                                                                                              35.5%;
                                                                                    0;
                                                                                                          Score 320.2;
Pred. No. 2.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aı protein
?.1"
                                                                                    2.8e-58;
ches 328;
                                                                                                                                             DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rv2954c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rv2953
                                                                                                                                          Length
                                                                                    18;
                                                                              Gaps
                                                                                    2
```

```
JOURNAL REFERENCE
                                                                 REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    õ
                                                                                                                                                                                                                                                                                                                                                                                                                               Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      рь
                                                                                                                                                                              SOURCE
ORGANISM
                                                                                                                                                                                                                                                 VERSION
                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                         MTU00024
                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                                                                                          KEYWORDS
                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                     Pocus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1045
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                               805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        865
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         φ
                                                                                                                                                                                                                                                                                                                                                                                                                               G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caggccgcgacgatcaagcgcttcgccgaccgctttgctcgcttcaatctgcaggagagag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gccttttcggcagcaccgaatttcgcctttgaactagcggcacgaagaacaaccgacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAAAAGGTTCCG-----TCAACTCCCGTATCGTGGCTGCCGTTCTATCACGACATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tcccatcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcgggatacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tctaccgcgtatttgcaatacacctccgggtccaccccgcacgcccgctggcgtggtgatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgttggacgacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATATTGGCCCCGCAGGGCCTTGAATACATCATCGCCTTTATGGGTGTGCTGCAGGCTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AACGTCGCGACGCTGCGGCGCTTCACCGAGCGGTTCGCCCCGTTCAACCTCAGCGAGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GATATGGCTGGACTTGACCTCGGGCATGTGCGGACGATCGTCACCGGCGCCGAACGAGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CAGATTTCCAGCGCACCGAATTTCGGTTTCGAATTGGCGGTACGCAGAACATCCGACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCCATGGCATTCTTGCAGCGGCCGGCCCGTTGGATGCAATTATTAGCCAAACACCGCGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGGTTGATGCTGGGCATCATTCTCCCGATGATCAATCAAGACACCGCGGTGTTGATGAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ggtttggtaataggaatttgcgcaccaattctgggtggataccccgcggtgctcaccagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gacgggattccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TCGCACAAGAATGTCATCACCAACTGCGTACAGCTAATGTCCGATTACATCGGGGATTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GTGGACGCTCTGGACTTGAGCTCATCCAGAGCGCTCGATCCGACTCGGTTCGAGCGTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gttgatttgctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatcca 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACGACATATGCGCCACATGCGTGCGCCGCCACAGGGCCAGTCCGCGCCCATCGTGGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCATTACGAGACTCTGCGCCCGTCCATTATTCTTACGACCTCGTCGGTTATTGACGAGGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            892
                                                                                                                                                                           Mycobacterium tuberculosis. Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                        Mycobacterium tuberculosis U00024
                                                                                                                                                                                                                                                                                                                                                                                                                               805
  Robison, K.
                                       Unpublished
                                                                     Smith
                                                                                                                               Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                 U00024.1
                                                                                                                                                                                                                                                                                                                  MTU00024
                                                                                                             Mycobacterium;
                    (bases 1
                                                                                     (bases 1 to
                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtgcaacatgttgcgcggcggccggggaatccccgccatcaattatcgaa
                       ç
                                                                                        Mycobacterium 31175)
                                                                                                                                                                                                                                                                                                                  ģ
                                                                                                                                                                                                                                                                                                cosmid
                                                                                                             tuberculosis
                                                                                                                                                                                                                                                                                                tbc2
                                                                                                             complex
                                                                                                                                                                                                                                                                                                                  29-SEP-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            986
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
JOURNAL
CDS
                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (29-SBP-1994) Department of Genetics, Harvard Medical School, 200 Longwood Avenue, Boston MA 02115 on Oct 27, 1994 this sequence version replaced g1:414230 g1:414. This sequence by the Genome Sequencing Center
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    located at Genome Therapeutics Inc. (formerly Collaborative Research Inc.) (100 Beaver St., Waltham MA, 02154 617-893-5007). Please contact Doug Smith (smith@cr.cric.com) for further
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Direct Submission
Submitted (29-SEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           incomplete.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             information. The annotation should be considered
                                                                                                                                                                                                                                   //LTAISI 14110.9 MFSKVLVANRGEIAIRAFRAAYELGVGTVAVYPYEDRNSQHRLK
ADESYGIGDIGHPVHAYLSVDEIVATARRAGADAIYECYGFLSENPDLAAACAAAGIS
FVGPSAEVLELAGNKSRAIAAAREAGLEVLMSSAPSASVDELLSVAAGMPFPLFVKAV
AGGGGRGMRWGDIAALPEAIEAASREAESCEPTVYLEQAVINPRHIEVOILADNL
GDVIHLYERDCSVQRRHQKVIELAPAPHLDAELRYKMCVDAVAFARHIGYSCAGTVEF
LLDERGEYVFIEMNPRYQVEHTWTEEITDVDILVASQLRIA AGGGTLEQLGLRQEDIAPH
GBALQCRITTEDDFANGFRPTRAGSARCDPPAVPVSAWTAAPTWRRNQPVLRIHAGQAD
LSGRDLPTAVSBARRAIAEFRIGVSTNIPFLQAVLDDDFRAGRVTTSFIDERQLL
TARASADRGTKILNFLADVTVNNPYGSRPSTIYPDDKLPDDLRAAPPAGSKQRUKL
GPEGFARWLRESAAVGVTDTTFRDAHQSLLATRVRTSGLSRVAPYLARTMPQLLSVEC
WGGATYDVALRELKEDPWERLATLRAAMPNICLQMLLRGRNTVGYTFYPEIVTSAFVQ
EATATGIDIFRIFDALNNIESMRPAIDAVRETGSAIAEVAMCYTGDLTDPGGQLYTLD
YYLKLAEQIVDAGAHVLAIKDMAGLLRPPAAQRLVSALKSRFDLLPHLHTHDTPGGQL
ASYVAAWHAGADAVDGAAAPLAGTTSQPALSSIVAAAAHTEVDTGLSLSAVCALEPYW
EALRKYVAPFESGLPGFTGRVYHHEIPGGQLSNLRQQAIALGLGGRFEELEEAYAGAD
RVLGRLVKVPFTSKVVGDLALALVGAGVSADEPALSSIVAAAAHTEVDTGLSLSAVCALEPYW
EALRKYVAPFESGLPGFTGRVYHHEIPGGQLSNLRQQAIALGLCGRFEELEEAYAGAD
RVLGRLVKVPFTSKVVGDLALALVGAGVSADEPASDPARFGIPPSVLGFLREGELGDPP
GGWPEPLRTAALAGRGAARPTAQLAADDEIALSSYGAKRQATLNRLLFPSPTKEFNEH
REAYCDTSQLSANGFFYGLROGEEHRVKLERGVELLGLEAISBPDERGMTTVEGILN
GQLRPVLVRDRSIASAVPAAEKADRGNPGHIAAPFAGVVTVGVCVGERVGAGQTIATI
EAMKWEAPTTAPVAGTVRAVSDTAEWRAETCWWW"

5057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="SPRCARTLAGFESRLACRRYARGAVALTAAAN'SRQIEHVRISETVADKSKREPRFDLKSADGSFGRLYQIGGTTIVVVFAVLLYFIVSEDDKKDCVAGFGVACFGVLLYFIVSKDDKKDVAGFGVACFFDAVLLYFIV'SRDDKKDVDGAVADFYDAVRTYSSKLVTGFGSNFKAVVSFYEDFLCFAAGIFERFGFTVSKLVDIGAVAADYTWAAILDSASNOHYSSRAAAAAXCVADESIEAFRRFHAALFSKDIQPAELGKDFDNARLIELAREAGVVGKVPDCINSGKYIEKVDGLAAAAVNVHATPTVRVNGTEYEWSTPAAL
                                       /translation="mQwGyrPLAGDEAMRwGyrPLARESGALDPDHRRCRRRRIAVP
PRGTRPTTDRVRESLFNIVTARRDLTGLAVLDLYAGSGALGLEALSRGAASVLFVESD
QRSAAVIARNIEALGLSGATLRRGAVAAVVAAGTTSPVDLVLADPPYNVDSADVDAIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /protein_id="AAA50949.1"
/db_xref="q1:560528"
/db_xref="q1:560528"
/translation="MyAAERSGDPAAVRVPVPSAWWVLIGGVIGLFASMTLTVEK
/translation="MyAAFAERSGDPAAVRVPVPSAWWVLIGGVIGLFASMTLTVEK
/VRILLDPIYVPSCNVWPIVSCGSVMTTPQASLLGFPNPLLGIAGFTVVVVTGVLAVAK
VPLPRWYWIGLAVGILVGVAFVHWLIFQSLYRIGALCPYCMVVWAVIATLLVVVASIV
FGPMRENRGSQERVGARLLYQWRWSLATLWFTTVFLLIMVRFWDYWSTLI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         908.
AALGTNGWTREGTVAVVERATTCAPLTWPEGWRRWPQRVYGDTRLELAERLFANV" 5790. .6275
                                                                                                      /product="u0002d"
/protein_id="AAA50947.1"
/db_xref="GI:560526"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="pyc"
/protein_id="AAA50948.1"
/db_xref="GI:560527"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VAKIKETVGDVPGIDSAAATATS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /protein_id="AAA50950.1"
/db_xref="GI:560529"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
/product="u0002a"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Mycobacterium
/db_xref="taxon:1773"
                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="u0002b"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               preliminary and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gi:414230
Center
```

```
/Protein_id="AAA50944.1"
/db_xref="G1:560523"
/db_xref="G1:560523"
/db_xref="G1:560523"
/translation="Mistry Edrival AVIGAIGHALALTASMTWEILWALILGFALSA
VVQAVVRRSTIVTLLGDDRPRTLVIATGLGAASSSCSTAAVALARSLERKGANETAAM
AFEIGSTNLVVELGIILALLMGWOFTAAEFVGGPIMILVLAVLFRLFYGAALTAARE
QAERGLAGSMEGHAAMWASIKREGSFWRRLLSPBGFTSIAHVFVMEWLAILLRDLILGL
LIAGAIAAWVPESFWQSFFLANHPAWSAVWGPIGPIVAIVSFVCSICRVPLAAVLM
GGISFGGVIAFIFADLLILPIINIYRKYTGARWLVLLGTFYAGAWVVAGYLLELLFGT
GGISFGGVIAFIFADLLILPIINIYRKYTGARWLVLLGTFYAGAWVVAGYLLELLFGT
                                                                                                                                                                                   YYGNLVWTKTTYMGINCWKSYSDMWNYQEILSELQPSLVIEFGTRYGGSAVYFANIMR
QIGQPFKVLTYDNSHKALDPRARREPDVLFVESSSTDPAIAEQIQRLKNEYPGKIFAI
LDSDHSMNHYLAEMKLLRPLLSAGDYLVVEDSNINGHPYLPGFGPGPYEAIEAYEDEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /protein_id="AAA50945.1"
/db_xref="GI:560524"
/db_xref="GI:560524"
/tanslation="MGRSMTAHATPNEPDYPPPPGGPPPADIGRLLLRCHDRPGII
/translation="MGRSMTAHATPNEPDYPPPGGPPPADIGRLLLRCHDRPGII
AAVSTEIARAGANIISLDOHSTAPEGGTFLQRAIFHLPGLTAAVDELQRDFGSTVADK
FGIDYRFAEAAKPKRVAIMASTEDHCLLDLLWRNRGELEMSVWVIANHPDLAAHVR
FGIDYRFAEAAKPKRVAIMASTEDHCLLDLLWRNRGELEMSVWVIAHPDLAAHVR
FGIDYRFAEAAKPKRVAIMASTEDHCLLDLSGNUDLVLLARVMQILSPGFLEAGGCPLIN
PFGVPFIHIPAJRDFRFREAGRQLQLCLSGNUDLVLLARVMQILSPGFLEAGGCPLIN
HSSELPATTGAAPYDRARERGVKLIGATAHYVTEVLDEGPIIEQDVVRVDHTHTVDDL
                                                                                                                                                                                                                                                                   /product="u0002jb"
/protein_id="AAA50941.1"
/protein_id="AAA50941.1"
/db_xref="GI:560520"
/translation="MGLVWRSRTSLVGQLIGLVRLVASFAAQLFYRPSDAVAEEYHKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TRPRWIPAACGECSAPHAGEPAPDMVGQLVTST"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="mpanafyadylpgeaaaarsavvvcnggslttqqalvagvpvig
vagnldqhlnmeaveragagvllrterlksqrvagavmqvisrseyptsrratrrclr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="u0002h"
/protein_id="AAA50942.1"
/db_xref="GI:560521"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IANAYWSPYAQRRFPLPDVIWTRLFGVRLVKLLYRLERPLLFALQCMPLNWVRRRHGL
SSLGWNLCRIFTDGDHTLYADVPELMPTYDLPANHEYLGPVLWSPAGKPPTWWDSLPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RILFVAEAVTLAHVVRPFALAQSLDPSRYEVHFACDPRYNQLLGPLPFRHHAIHTIPS
ERFFGNLTOGRFYAMRTLRKYVEADLRVLDEIAPDLVVGDLRISLSVSARLAGIPYIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MRARSLPALLPSLGPPLWLRSRSALHHIPPGGIVTGVGNDRAVV
PLNVSPPHSCRGFPRVRVSCVYATASRWGGPPVASEVRGDAAISTTPDAAPGLAARRR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VRVGADVERAVLSRAVLWHCQDRVIVHHNQTIVF" complement(8149. .9369)
   /product="u0002ka"
/protein_id="AAA50940.1"
                                                                                                                             PNDYKHDAERENKFGWTSAPNGFLIRN"
12604. .13995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10439.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DRPIVYATLGTSGGRNLLQLVLNALAELPVTVIAATAAAVT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="u0002ja"
/protein_id="AAA50943.1"
/db_xref="GI:560522"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PHDHHDRHDDHLGH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TNLIPSQRSATVMTAEISWNYTTWLNVIFLVIAAALVVRFITSGGLPMLRMMGGSPDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /protein_id="AAA50946.1"
/db_xref="G1:560525"
/db_xref="G1:560525"
/translation="MYGAVCPGSFDPVTLGHYDIFERAAAQEDEVVVAILVNPAKTGM
/translation="MYGAVCPGSFDPVTLGHYDIFERAAAQEDEVVVAILVNPAKTGM
FDLDERIAMVKESTTHLPNLRVQVGHGLVVDFVRSCGMTAIVKGLRTGTDFEYELQMA
                                                                /transl_table=11
                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="u0002f"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(7144.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QMNKHIAGVDTFFVATAPRYSFVSSSLAKEVAMLGGDVSELLPEPVNRRLRDRLNTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="u0002e"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .10433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .10846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .8076)
QУ
                                                                Вþ
                                                                                                                      δÃ
                                                                                                                                                                                   В
                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
   412
```

CDS

CDS

SgS

CDS

tctaccgcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatg 471

CDS

CDS

```
Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22385
  22685
                                                                                                                                                                                                     22565
                                                                                                                                                                                                                                                                                                        22505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <del>ب</del>
                                                                                             ACGACATATGCGCCACATGCGTGCGCCGCACAGGGCCAGTCCGCCCATCGTGGCT
                                                                                                                                                                                                                          gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgtc 300
                                                                                                                                                                                                                                                                                                                                                                                                                             atctctgctccgcagggactcgagtacgtcgtcgcctatctcggcgcgttgcagaccggg 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgaacgctgaatgtggcacaggagctgagccgttgtgggttccacggggtgaccgcgtggtg 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GACTATGACACGGATCCGGCTTGACCGAAACCGTGACGTGGTGGCAAGTCCACCGG 22+84
GTGGACGCTCTGGACTTGAGCTCATCCAGAGCGCTCGATCCGACTCGGTTCGAGCGTCCG
                                                                                                                                                                                                                                                                                                                             cgcatcgccgttgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGAGCGATGATCGTGGCAGAGGAGCTCTGGATATACGCGTCAAGCGGTGATCGGGTCGCG
                                                                                                                                                                                                   GCATTACGAGACTCTGCGCCGTCCATTATTCTTACGACCTCGTCGGTTATTGACGAGGTC
                                                                                                                                                                                                                                                                                                ATATTGGCCCCGCAGGGCCTTGAATACATCATCGCCTTTATGGGTGTGCTGCAGGCTGGT 22504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg 60
                                            gttgatttgctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatcca 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                       -gtgcaacatgttgcgcggcggcccggggaatccccgccatcaattatcgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /Product="u0002kb"
/protein_id="AAA50939.1"
/protein_id="AAA50939.1"
/db_xref="G1:560518"
/translation="MKSLKLARFIARSAAFEVSRRYSERDLKHOFVKQLKSRRVDVVF
/VTANSCQYAAGLRRAAYKGRYVSFEPLSGPFTILESKASTDPLMDCROHALGDSDGT
VTINIAGNAGQSSSVLPMLKSHQNAFPPANVYGTOBASIRIDSVAPERIGMNGVAFL
KVDVQGFEKQVLAGGKSTIDDHCVGMQLELSFLPLYEGGMLIPEALDLVYSLGFTLTG
LLDCFIDANNGRMLQADGIFFREDD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IAROTCGDFELVLVDGGSTDETLDIANIFAPNLGERLIIHRDTDOGVYDAMNRGVDLA
TGTWLLFLGADDSLYEADTLARVAAFIGEHEFSDLYYGDVINSTNIFRGGAFDLDRL
LFKRNICHQALFYRRGLFGTTGPYNLGYRVLANDDFNIRCESNPALVTRYMHVVVASY
NEFFGGLSNTIVDKEFLKRLPMSTRLGIRLVIVLVRRWPKVISRAMVMRTVISWRRRR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGKNLLQVVLNALADLPVTVIAATAGRNHLKNVPANAFVADYLPGEAAAARLAVVLCN
GGSPTTQQALAAGVPVIGLPSNMDQHLNMEALERAGAGVLLRTERLNTEGVAAAVKQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VVRPEVLARSLDPSRYEVHFACDPRFNKLLGPLPFPHHPIHTVPSEEVLLKIAOGRLF
YNTRTLRKYIAADRKILNEIAPDVVVGDNRLSLSVSARLAGIPYIAIANAYWSPQARR
REPLPDVPWTREFGVRPVSILYRLYRPLIFALYCLPLNWLRRKHGLSSLGWDLCRIFT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(15203. .15934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(14306.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VAVQNAEVPQRLS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17208. .17933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /protein_id="AAA50938.1"
/db_xref="GI:560517"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="u0002kc"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         {	t LSGAEFRQAARRLPKPSDQTLPDSRSTSKVRCGSSAKGCPRYRRLANGCPVEHLIRER}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DGDYTLYADVPELVPTYNLPANHRYLGPVLWSPDVKPPTWWHSLPTDRPIIYATLGSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         translation="MRLPGMLRPTAERHFHSIFYLRHNARRQEHLATLGLDLGNKSVL/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /protein_id="AAA50937.1"
/db_xref="GI:560516"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="u00021"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /translation="MVQTKRYAGLTAANTKKVAMAAPMFSIIIPTLNVAAVLPACLDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="MEETSVAGDPGPDAGTSTAPNAAPEPVARKvkTLFVGEAATLAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    'db_xref="GI:560519"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. 1.3e
); Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 317.2;
Pred. No. 1.:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .15133)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.3e-57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    323;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                 351
                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                22624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22444
22744
                                                                                                22684
                                                                                                                                                                                                                                                                                                22564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
```

```
BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
AUTHORS
TITLE
                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
MSGY2
LOCUS
                            ρ
                                                                             밁
                                                                                                                                                                            Ъ
                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VERSION
                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OURNAL
                                                                             22385
                                                                                                                                                                              22325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22865
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                23096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  712
                                                                                                                           61
                                                                                                                                                                                                                             Н
                                                                                                                                                                                                     gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg
                                                                                                         cgaacgctgaatgtggcacaggagctgagccgttgtggttccacgggttgaccgcgtggtg 120
atctctgctccgcagggactcgagtacgtcgtcgtcgcctatctcgggcgcgttgcaggccggg
                                                                                                                                                                            GACTATGACACGGATCCGGCTGGCTTCACCGAAACCGTGACGTGGCGAAGTCCACCGG
                                                                             CGAGCGATGATCGTGGCAGAGGAGCTCTGGATATACGCGTCAAGCGGTGATCGGGTCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AACGTCGCGACGCTGCGGCGCTTCACCGAGCGGTTCGCCCCGTTCAACCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     caggccgcgacgatcaagcgcttcgccgaccgctttgctcgcttcaatct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GATATGGCTGGACTTGACCTCGGGCATGTGCGGACGATCGTCACCGGCGCCGAACGAGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CAGATTTCCAGCGCACCGAATTTCGGTTTCGAATTGGCGGTACGCAGAACATCCGACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gccttttcggcagcaccgaatttcgcctttgaactagcggcacgaagaacaaccgacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCCATGGCATTCTTGCAGCGGCCGGCCCGTTGGATGCAATTATTAGCCAAACACCGCGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccggtgtcgttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ggtttggtaataggaatttgcgcaccaattctgggtggataccccgcgggtgctcaccagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tcccatcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcggatacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             al Similarity
549; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGGTTGATGCTGGGCATCATTCTCCCGATGATCAATCAAGACACCGCGGTGTTGATGAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAAAAGGTTCCG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gacgggattccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TCGCACAAGAATGTCATCACCAACTGCGTACAGCTAATGTCCGATTACATCGGGGGATTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Direct Submission
Submitted (11-OCT-1996)
Beaver Street, Waltham,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSDB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Du
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacteria; Firmicutes; Actinobacteria; Actinobacterida Actinomycetales; Corynebacterineae; Mycobacteriue; Mycobacterium; Cobacterium; Mycobacterium; Mycobact
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium tuberculosis AD000009
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AD000009.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis (clone:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MSGY2
                                                                                                                                                                                                                                                                                                                                                                                                                                5417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             er Street,
:S:1004709
                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Mycobacterium tuberculosis"
/db_xref="taxon:1773"
/Clone="y2"
9198 c 10570 q 5001 +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GI:1702967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     31176
                                                                                                                                                                                                                                                                                                  35.1%;
61.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               - TCAACTCCCGTATCGTGGCTGCCGTTCTATCACGACATG
                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                           Score 317.2; DB 2;
Pred. No. 1.3e-57;
0; Mismatches 323;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  L.Du,
MA, U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Genome Therapeutics Corporation, SA, 02154 du@cric.com
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            y2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ds-DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BCT
clone
                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 y2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               881
                                                                                                                                                                                                                                                                                                                              31176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        03-DEC-1996
                                                                                                                                                                                                                                                                           18;
                                                                                                                                                                                                                                                                           Gaps
                              180
                                                                                                                                                                         22384
                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               23095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22804
                                                                             22444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                23155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              100
                                                                                                                                                                                                                                                                           2;
```

```
LOCUS
DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                       RESULT
MTCY338
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Дb
                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QY
                                                                                                                                                                                                                                                 SOURCE
                                                                                                                                                                                                                                                                                    VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                            23156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22865
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          22745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                         14
                                                                                                                                                                                                                                                                                                                                                                                                                                              caggccgcgacgatcaagcgcttcgccgaccgctttgctcgcttcaatct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAGATTTCCAGCGCACCGAATTTCGGTTTCGAATTGGCGGTACGCAGAACATCCGACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccttttcggcagcaccgaatttcgcctttgaactagcggcacgaagaacaaccgacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ccggtgtcgttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggtttggtaataggaatttgcgcaccaattctgggtggataccccgcgggtgctcaccagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gacgggattccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tctaccgcgtatttgcaatacacctccgggtccacccgcacgcccgctggcgtggttgatg
                                                                                                                                                                                                                                                                                                                                                                                                                          AACGTCGCGACGCTGCGGCGCTTCACCGAGCGGTTCGCCCCGTTCAACCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GATATGGCTGGACTTGACCTCGGGCATGTGCGGACGATCGTCACCGGCGCCGAACGAGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCCATGGCATTCTTGCAGCGGCCGGCCCGTTGGATGCAATTATTAGCCAAACACCGCGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGGTTGATGCTGGGCATCATTCTCCCGATGATCAAGACACCGCGGTGTTGATGAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAAAAGGTTCCG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TCGCACAAGAATGTCATCACCAACTGCGTACAGCTAATGTCCGATTACATCGGGGATTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tcccatcagaacgttcgggttaatttcgaacagctgatgtctggctactttgcggatacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GTGGACGCTCTGGACTTGAGCTCATCCAGAGCGCTCGATCCGACTCGGTTCGAGCGTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCATTACGAGACTCTGCGCCGTCCATTATTCTTACGACCTCGTCGGTTATTGACGAGGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATATTGGCCCCGCAGGGCCTTGAATACATCATCGCCTTTATGGGTGTGCTGCAGGCTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gttgatttgctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACGACATATGCGCCACATGCGTGCGCCGCACAGGGCCAGTCCGCGCCCATCGTCGTGGCT
Colè,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C., Harris,D., Gordon,S.V., Eiglmeier,K., Gas,S., Barry III,C.E., Tekaia,F., Badcock,K., Basham,D., Brown,D., Chillingworth,T., Connor,R., Davies,R., Devlin,K., Feltwell,T., Gentles,S., Hamlin,N., Holroyd,S., Hornsby,T., Jagels,K., Krogh,A., McLean Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A., Rajandream,M.A., Rogers,J., Rutter,S., Seeger,K., Skelton,S., Squares,S., Sqares,R., Sulston,J.E., Taylor,K., Whitehead,S. abarrell,B.G.
                                                                                                                                                                                   Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Mycobacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Firmicutes; Actinobacteriae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                    MTCY338 29372 bp DNA
Mycobacterium tuberculosis
Z74697 AL123456
                                                                                                                                                          Mycobacterium.
1 (bases 1 to 29372)
                                                                                                                                                                                                                                                                                    Z74697
                                                                                                                                                                                                                                                                                    7 AL123456
7.1 GI:326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -gtgcaacatgttgcgcggcggcccggggaatccccgccatcaattatcgaa
                                                                                                                                                                                                                                                                                    GI:3261602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TCAACTCCCGTATCGTGGCTGCCGTTCTATCACGACATG
                                                                                                                                                                                                                                                                                                                                          DNA
                                                                                                                                                                                                                                                                                                                    H37Rv complete
                                                                                                                                                                                                                                                                                                                      genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               881
                                                                                                                                                                                                                                                                                                                                                                                                                            23205
                                                                                                                                                                                                                                                                                                                    17-JUN-1998
segment 127/162.
                                                                        McLean, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  831.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               23,155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          22804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22624
                       and
```

CDS

gene

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REMARK
                                                                                                                                                                                                                                                                                             gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SdC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Direct Submission
Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhillsanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2245330.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg. 9tg. or ttg) which is preceded by an upstream ribosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        available on the World Wide Web.
(URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Details of M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Parkhill, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        initiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Erratum:[[published erratum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complete genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Deciphering the biology of Mycobacterium tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12;396(6707):190]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (bases 1 to 29372)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        renumbered from the original cosmid submissions but the old
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tg, or ttg) which is preceded by an upstream ribosome site sequence (optimally 5-13bp before the initiation If this cannot be identified we choose the most upst:
complement (1865. .2977)

complement (1865. .2977)

/gene="Rv2915c"

/note="Rv2915c, (MTCY338.03c), unknown, len: 370, sim:

to YJV3_YEAST P40896 hypothetical 35.9 kd protein in l

to YJV3_YEAST P40896 hypothetical 35.9 kd protein in l

(331 aa) FASTA scores, opt: 228, z-score: 264.5, E():

3.5e-08, (26.6% identity in 237 aa overlap). Also some similarity to AL021428|MTV030_18 Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene-"pkni"
/note-"Rv2914c, (MTCY338.02c), len: 585, Probable
/note-"Rv2914c, (MTCY338.02c), len: 585, Probable
serine/threonine-protein kinase similar to many in M.
tuberculosisand other bacteria eg PKNI_MYXXA P33973
serine/threonine-protein kinase pknl. (693 aa) FASTA
scores, opt: 286, z-score: 296.9, E(): 5.4e-10, (29.98)
identity in 374 aa overlap);also similar to MTCY49.28
(34.78 identity in 479 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="mALASGVTFAGYTVVRMLGCSAMGEVYLVQHPGFPGWQALKVLS
PAMAADDEFRRRFQRETEVAARLFHPHILEVHDRGEFDGQLWIAMDYVDGIDATQHMA
DRFPAVLPVGEVLAIVTAVAGALDYAHQRGLLHRDVNPANVVLTSQSAGDQRILLADF
                                                                                                                                                                                                                                                                                                                                                                                          SAPTTTVAVTAPVPLDGTYR1E1QRSKQTYDYTPTPQPPDVNTWWAFRTSCTPTECLA
AATMLDDNDHTQAKTPPVRPFLMQFGEGQWKSRPETVQFPCVGPNGSPSTQATTQLLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                               GEEAYVVDYPAYGWPEAVDCKEPSARAPAAPTPQRRGSMLQSAAGVLARRLDNFST
ATKAPASPTRRRPRRILVGAVAVLLLAGLFAVGIVIGRKTNTTATEVARPPTSGSAVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GIASQPSYPAPELSAGADVDGRADQYALALTAIHLFAGAPPVDRSHTGPLQPPKLSAF
                                                                                                                                                                                                                                                                                     complement(1865. .2977)
                                                                                                                                                                                                                                                                                                                             TTSTATLTPPTTTAPGPGR"
                                                                                                                                                                                                                                                                                                                                                             LRPQPQGDLVGEMVVTVHSNECGQQGAVIRIPAVASRSGDLPPAVTVPDPATIPDTPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RPDLARLDGVLSRALATAPADRFGSCREFADAMNEQAGVAIADQSSGGVDASEVTAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /protein_id="CAA98986.1"
/db_xref="GI:3261603"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="pkn1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(64. .1821)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(64. .1821)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                     /gene="Rv2915c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="pknI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /clone="Y338"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Mycobacterium tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 2937:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculosis sequencing at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             appears
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             in Nature 1998 Nov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 choose the most upstream
                                                                                                                                                len: 370, similar
                                                                                                               in hxt8-
```

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="Rv2917"
4660 /c=-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Rv2917, (MTCY338.05), unknown, len: 626; highly similar to M. leprae hypothetical protein MLCB250.18c (aa), fasta scores; opt: 3117 z-score: 3991.4 E(): 0, 79 identity in 584 aa overlap. Contains PS00017 NTP/GTP-binding site motif"
                                                                                                                                                                AELLRYHTVEQVTVVVPTEHLKVQWAHAAAAHGLSLDPKFANSNPOTSPEYHGVMVTY
AQVASHPTLHRVGTEARKTLVVFDEIHHGGDAKTWGDALREAGTGREALTGTPFR
SDDSBIPFVSYQPDAGGVLRSQADHTYGYAEALADGVVRPVVFLAYSGQARMROSAGE
EYEARLGEPLSAEQTARAWRTALDPEGEWMPAVITAADRRLRQLRAHVPDAGGWIIAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MFESLSDRLTAALOGLRGKGRLTDADIDATTRE!KLALLEADVS
LPVVRAPIHRIKERARGAEVSSALNPAQQVVKIVNEELISILGETRELAFAKTPPTV
VMLAGLQGSGKTTLAGKLAARLRGGOGHTPLLVACDLQRPAAVNGLQVVGERGGVPVFA
PHPGASPESGPGDPVAVAAAGLAEARAKHFDVVIVDTAGRLGIDEELMAQAAAIRDAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DRASADLLCYAQDPRQGPGVLQHPDLVILRGRTFGP"
complement(3005. .4582)
/gene="ffh"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MKRVDTIRPRSRAVRLHVRGLGLPDETAIQLWIVDGRISTEPVA GADTVFDGGWILPGLVDAHCHVGLGKHGNVELDEAIAQAETERDVGALLLRDCGSPTD TRGLDDHEDLPRIIRAGRHLARPKRYIAGFAVELEDESQLPAAVAEQARRGDGWVKLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NPDEVLFVLDAMIGQDAVTTAAAFGEGVGFTGVALTKLDGDARGGAALSVREVTGVPI
LFASTGEKLEDFDVFHPDRMASRILGMGDVLSLIEQAEQVFDAQQAEEAAAKIGAGEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P37105 signal recognition particle protein (fifty-four homologue, (446 aa) FASTA scores, opt: 1451, z-score: 1409.6 E(): 0.Smith-Waterman score: 1451; (51.5% identity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GDWIDRQIGDLAPLWSDDVLKAAIDTAHAQGARVTAHVFSEDALPGLINAGIDCIEHG
TGLTDDTIALMLEHGTALVPTLINLENFPGIADAAGRYPTYAAHMRDLYARGYGRVAA
DLRRELHTLVSIAHHRTGKPHGWIHDERRRRCGGPPIAAATRAQIKARIDALRQLNSE
                                LGRPHRESAHDPLDGDPATRTQTERGGAERGFTALGADAELDQVIFDGSSFGTATPTG
SDEEADYLGIPGLLDAEQMRALLHRRQDEQLRKRAQLQKGATQPATSGASASVHGQLR
                                                                                                DRTTARAYARLLITMTAEEPTVVLSDDPGSSARITEFAQGTSRWLVAVRMVSEGVDVP
RLSVGVYATNASTPLFFAQAIGRFVRSRRPGETASIFVPSVPNLLQLASALEVQRNHV
                                                                                                                                                                                                                                                                                                           VRSDGGWGVLQPVSATFNPPLRGWQRRALVQYLGTQPRDFLAVATPGSGKTSFALRIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(4241. .4264)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PGLADFDLSKLKFPGKK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADPKIINASRRLRIANGSGVTVSEVNOLVERFFEARKMMSSMLGGMGIPGIGRKSATR
KSKGAKGKSGKKSKKGTRGPTPPKVKSPFGVPGMPGLAGLPGGLPDLSQMPKGLDELP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TLEDFLEQMLAVRKMGP1GNLLGMLPGAAQMKDALAEVDDKQLDRVQA11RGMTPQER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            particle protein,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(3005. .4582)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="hypothetical
/protein_id="CAA98977...
/db_xref="GI:1405950"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tuberculosis seque (411 aa) opt: 243 z-score: 298.2 E(): 4.4e-09; 27.5% identity in 389 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                           /product="hypothetical
/protein_id="CAA98979.1
/db_xref="GI:2245331"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /protein_id="CAA98978.1"
/db_xref="GI:1405951"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
/product="ffh"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        in 435 aa overlap); contains PS00017 ATP/GTP-binding site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AREAGVPVYAGTDAGSTIEHGRIADEVAALQRIGMTAHEALGAACWDARRWLGRPGLD
                                                                                                                                                                                                                                                                                                                                       translation="MRVTRLVDAESTRCDVGPAPKSVAMLHFTAATSRFRLGKERANS/
                                                                                                                                                                                                                                                                                                                                                                              /db_xref="SWISS-PROT:Q10966"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="Rv2917"
/note="Rv2917,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="PS00017 ATP/GTP-binding site motif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SWISS-PROT:Q10963"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="Rv2916c, (MTCY338.04c),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="ffh"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /db_xref="SWISS-PROT:Q10965"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               len: 525, similar to eg SR54_BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                           11 protein Rv2917"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nı protein Rv2915c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ffh, signal recognition
```

CDS gene

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches 534;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                            481
                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 gattacgaacaggactgggacggcgttgcgataaccctgacgcggtcgcagctgtatcgg 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               atetetgeteegeagggaetegagtaegtegtegeetateteggegegttgeaggeeggg 180
                                                                                                        tatttgcaatacacctccgggtccacccgcacgcccgctggcgtggtgatgtcccatcag 480
                                                                                                                                                                                                           ctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg
                                                                                                                                                                                                                                                                                                                                                                                                            cgcatcgccgtgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cyaacyctyaatytyycacayyayctyayccyttytyyttccacyyytyaccycytyyty 120
aacgttcgggttaatttcgaacagctgatgtctggctactttgcggataccgacgggatt
                                                                           ACGAAATACGCAGCCAGCCACGACGGGCAGCCTGCCCCGGTCGTAGTTGAGGTTGATCTG
                                                                                                                                                                                                                                                                                                                              gtgcaacatgttgcgcggccggcccggggaatccccgccatcaattatcgaagttgatttg
                                                                                                                                                                                                                                                                                                                                                                                  GTGTTGCAGGATTCCAAGCCGGTAGCCATTCTCACGACTTCGTCGTGGTAGGCGATGTA 22377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TTTATCGCGGTTCCGCTGTCAACTCCACAGTATGGCATTCACGATGACCGCGTTTCTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTTTTAGCGCCACAAGGACTGGAATATGTCCTTGCATTCCTGGGCGCACTTCAGGCTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGTGCATGCATCATTGCTGAAGAACTCAAGTTATGCGGGGTTACCCGGAGATCGAGTGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GACTACGGATCCGACCCCAAGGGATTTGCTGACAGCTTGACTTGGTCGCAGGTCTACAGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MEAESPCÄASDLAVARRELLSGNHRELDPVGLRQTWLDLHESWL
IDKADEIGIADASGFATYGVGGLGRRELLPYSDLDVLLLHDGKRADILRPVADRLWYP
LWDANIRLDHSVRTVSEALTIANSDLMAALGMLEARHIAGDQOLSFALIDGVRRQWR
GIRSRWGELVEMTYARWRRCGRIAQRAEPDLKLGRGGLRDVQLLDALALAQLIDRHGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAAVLALNSLRVHSASVNVHQGVAITEEVVSPLFGSPPAAELVRQQFVGALNGDVDVL
GMLQKRDSDAASLVSARAGDVQAGVPVTRTAAPPRILWLDTAAPAKLILEVRAMDRAG
LLALLAGALEGAGAGIVWAKVNTFGSTAADVFCVTVPAELDARAAVEQHLLEVLGASV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TVATIEALDRYGLWGRLLPEWBPIRDLPPRDVAHKWTYDRHVYETAVHAAPLATRVAR
PDLLALGALLHDIGKGRGTDHSVLGAELVIPVCTRLKETSPDVRRTLSKLVRHHLLLPI
TATRRDLUDPKTIEAVSEALGGDPQLLEVLHALSEADSKATGPCVWSDWKASLVDDV
RRCRWYMAGESLPQAEPTAPHYLSLAADHGVHVEISPRDGERIDAVIVAPDERGLVSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GHTDLPAGSLDGAYRTLLDVRTELHRVSGRGRDHLLAQFADEISAALGFGDRFDLART
LSSAGRTIGYHAEAGLRTAANALPRRGISALVRRPKRRPLDEGVVEYAGEIVLARDAE
PEHDPGLVLRVAAASADTGLPIGAATLSRLAASVPDLPTPWPQEALDDLLVVLSAGPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="Rv2918c, (MTCY338.07c), len: 808. glnD, Probable uridylyltransferase, similar to eg GLND_ECOL P27249 [protein-pil] (890 aa) FASTA scores, opt: 306, z-score: 390, E():2.5e-12, (27.7% identity in 857 aa overlap).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(9035. .9373)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(9035.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="glnD"
complement(6551. .8977)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="PS00017 ATP/GTP-binding complement(6551. .8977)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="glnB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="SWISS-PROT:Q10961"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /protein_id="CAA98971.1"
/db_xref="GI:1405954"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="glnD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="glnD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="Rv2917"
/note="PS00017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           34.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 313.4; DB 2;
Pred. No. 8.5e-57;
0; Mismatches 341;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   site motif
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 29372;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            overlap)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                            540
                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                               22437
                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22137
                                                                                                                                                                              22497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ۲,
```

Ş 멍 Ş В Ş 밁 δÃ Š

Qy 밁 Š 밁

Ş В

```
REFERENCE
AUTHORS
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 1
MLCB12/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γ
                                                                                                                                                                                                                 COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LOCUS
                                                                                                                                                                                                                                                                                                                                                                   AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22558 AATGTCATTGCCAATGTGACACAAAGTATGTACGGCTATTTCGGCGATCCCGCAAAGATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    acgatcaagcgcttcgccgaccgctttgctcgcttcaatct 881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTTTTGCGCCCGTCCGGCCTGGATGCAACTGCTTGCCACCAGCGGCCGGTGCTTTTCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ttcctgcagcgcccggcccggtggatgcacttgatggccagcgattttcacgccttttcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ataggaatttgcgcaccaattctgggtggataccccgcggtgctcaccagcccggtgtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccaccgccaaattccgcactcgtatcctggctacccttctaccacgacatgggttttggta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCGTGCGGCGGTTCATCGAGCGGTTCGCGCCGTACAATCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGGCTCGACCTGCGCGACGTGGTCGGCATCGTCAGTGGCAGTGAGCGAATCCATGTGGCA 2291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCGGCACCGAATTTCGCCTTCGAGCTGGCCGTGCGCAGAACATCTGACCAGGACATGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTCGGAATTTGCGCACCGCTGGTGGCCCGACGCCGCGCGATGTTGATGAGCCCAATGTCA 22731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGACCGGGACTG - - - - - TGGTGTCGTGGCTGCCTTTGTATCACGATATGGGCCTGATT
                                                                                                                                                                                         The
                                                                                                                                                                                                                                              Submitted (15-FEB-1999) Mycobacterium leprae sequencing project, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Dr. Stewart T. Cole, [3] Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France Requests for cosmids should be sent to Karin Elglmeier
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (URL, http://www.sanger.ac.uk/Projects/)
CDS are numbered using the following system eg MLCB33.01c. ML (M leprae), cB33 (cosmid name), .01 (first CDS), c (complementary
                                                                                                                                                                                                                                                                                                                                                                 James, K.D., Parkhill, J., Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                      Murphy, L. a. Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eiglmeier, K., Honore, N., Woods, S.A., Use of an ordered cosmid library to
                                                                                                                Work in Paris is supported by the Francaise Raoul Follereau and the
                                                                                                                                                                     by the Heiser Program for Research
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   of Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium leprae
AL035480
                                                           on the World Wide Web
                                                                           Details of M. leprae
                                                                                              Etudes des Genomes (GIP-GREG)
                                                                                                                                                      The New York Community Trust.
                                                                                                                                                                                                                                   (kei@pasteur.fr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  93188700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 34316)
                                                                                                                                                                                                                                                                                                                                                                                                                                                              (bases 1 to 34316)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 34316)
                                                                                                                                                                         Sanger Centre is funded to complete the sequence of M. leprae
the Heiser Program for Research in Leprosy and Tuberculosis of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Microbiol.
                                                                                                                                                                                                                                                                                                                                                                                                                                            and Harris,D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34316 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA
cosmid
                                                                             sequencing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     197-206
                                                                                                                                                                                                                                                                                                                                                                                     Barrell, B.G. and Rajandream,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      в12.
                                                                             аt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         to deduce
                                                                                                                  Groupement
                                                                                                                                      Heiser Trust,
                                                                             the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Caudron, B. and Cole, S.T. deduce the genomic organization
                                                                             Sanger
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22952
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BCT
                                                                                                                  de
                                                                              Centre
                                                                                                                    Recherches
                                                                                                                                      the
                                                                                                                    et
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       22851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22671
```

misc_feature Usually the highest scoring match found by fasta o is given for CDS which show significant similarity to other CDS in the database. The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon. All CDS over 100 codons have been analysed. Gene prediction is based on positional base preference in codons especially where there is an increase in the observed/expected third position G + C. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally \$1.350 before the initiation codon). If this cannot be identified overlapping sections once, or longer, because we arrange for a small overlap between neighbouring submissions. we choose the most upstream initiation codon.

IMPORTANT: This sequence MAY NOT be the entire insert of the sequenced clone. It may be shorter because we only sequence The more significant matches with motifs in the PROSITE database are also included but some of these may be fortuitous. The length in codons is given for each CDS. complement(52...4674)
/gene="MICB12.01c, probable polyketide synthase, len: 1540
/note="MICB12.01c, probable polyketide synthase, len: 1540
aa; similar to ERY1_SACER (EMBL:M65676) Saccharopolyspora
erythraea erythronolide synthase (3491 aa), fasta scores;
opt: 2230 z-score: 2283.7 E(): 0, 36.6% identity in 1550
aa overlap. N-terminus similar to the N-terminus of
MCAS_MYCBO (EMBL:M95808) Mycobacterium bovis mycocerosic
acid synthase (2110 aa) (42.2% identity in 879 aa
overlap). Also similar to many mycobacterial putative
polyketide synthases e.9. ppsB, Rv2932,
(MTV011.01-MTCY338.21) M.tuberculosis putative polyketide
synthase involved in phenolpthiocerol synthesis (1538 aa)
(76.3% identity in 1561 aa overlap). Annotated as ORF
TR:Q49932, designated pksC in M.leprae cosmid EMBL:U00023. /product="putative polyketide synthase"
/product="cass6627.1"
/protein_id="cass6627.1"
/protein_id="cass6663"
/db_xref=="Gi:4455663"
/translation="MRTAFSRISGMTTQQRAALIEEFTKLSRIAVAEPIAVVGIGCRF
/PRODUTGPDSFWDLLIDGRNAISRVPADRWDADAFYDPDPLTFGRMTTKWGGFYSDIAG
POANFFGITPREAAAMPOQORILEVAWEALENAGIPPDSLGNSRTGVMIGVYFNESVQ
SMLASSLENVDAYSGTCNAHSITVGRISYLLGLRGPSVAVDTACSSSLVAVHLACQSL
RLRETDLVLAGGVSITLRPETQIAISANGLLSPHGRCAAFDAAADGFVRGEGAGVVVL
RLRETDLVLAGGVSITLRPETQIAISANGLLSPHGRCAAFDAADGFVRGEGAGVVVL Pfām match to entry PF001 09 ketoacyl-synt, Beta-ketoacyl synthase, score 694.00, E-value 7.4e-205, Pfam match to entry PF00501 AMP-binding, AMP-binding enzyme, score -162.30, E-value 4.9e-06. Contains PS00606 Beta-ketoacyl Contains Pfam match to entry PF00550 pp-binding, Phosphopantetheine attachment site, score 42.90, E-value 3e-10, Pfam match to entry PF00698 Acyl_transf, Acyltransferase domain, score 467.00, E-value 1.6e-136, complement(1. .9070)

note="overlap with EMBL:U00023 cosmid L518 from 9070 to
1. There are 3 conflicts between this sequence and ours.
In each case our sequence has been checked and is thought SGRGSQWAGMGRQLLADEPAFTAAVAELEPVFVVHAGFSLHDVLANGKELVGIEQIQL GLIGMQLTLTELWRSYGVQPDLVIGHSLGEVAAAVVAGALTAAEGLRVTATRSRLMAP AHVVIEQGPELTPVTECSSNTAVSTLVVTGKTASRVAAMAGMLADWVEGPGAEVALAD VAHTLNHHRSRHAKFGTVVARDRIQAVAGLRALAAGKQAPGVVGQQDGTPGSGTVFVY synthases active site" /gene="MLCB12.01c" KRLTDAVRDGDLVLAVVRGSAVNQDGRSNGVTAPNTAAQCDVITDALRSSDVAPESVN YVESHGTGTVLGDPIEFEALAATYGRGESACALGAVKTNLGHLEAAAGIAGFIKTVLA to VQRGQIPPNLHFSQWNPAIDAASTRFFVPTENSSWPISDGQAGPRRAAVSSFGLGGTN /transl_table=11 /clone="cosmid B12" /organism="Mycobacterium leprae" /db_xref="taxon:1769" Location/Qualifiers /codon_start=1 be correct" .4674)

> CDS gene

DAVVLSGELTDLLGKTVSPIDEWEHPTINALAAYLIAPAPDPESESAPRRSVQGALEE
PIAVIGMGCREPGGISGPEALMQFLCDRRSSIGQVPNERWELEDDGSPEVKALLARTT
RWGSFLEDLIAPADBEFEEISPESADKMDPQQRLLLEVAWEALEHAGISSNSLERSQF
VFAGSCLSEYGAIASTDLSQVDGWSNTGGAMSIIANRLSYFLDLRGPSVAVDTACSSS

CDS gene ATURES

source

repeat_unit

```
misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(4675. 10290)
/gene="MLCB12.02c"
complement(4675. 10290)
/gene="MLCB12.02c"
/gene="MLCB12.02c"
/note="MLCB12.02c"
/no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      two Ffam matches to entry PF00550 pp-binding, two Ffam matches to entry PF00550 pp-binding, Probable 2.5e-15, Pfam match to entry PF00698 Acyl_transf, Acyltransferase domain, score 467.00, E-value 1.6e-1.36, Pfam match to entry PF00199 ketoacyl-synt, Beta-keto acyl synthase, score 626.50,
                                                                                                                                                                                                                                                                                                                                                  residues)"
                                                                                                                                                                                                                                                                                                                                                                                                                                     Evalue 1.5e-184. Contains PS00012 Phosphopantetheine attachment site, PS00606 Beta-ketcacyl synthases active site and probable coiled-coil from 1748 to 1781 (34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AMP-binding enzyme, score -162.30, E-value 4.9e-06" complement (4042. 4092) /gene="MLCb12.01c" /note="PS00606_Beta_ketoacyl synthases active site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="Pfam match to entry PF00109 ketoacy1-synt,
Beta-keto acy1 synthase, score 694.00, E-value 7.4e-205"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Acyltransferase domain, score 467.00, E-value 1.6e-136" complement(3298. .4572) /gene="MLCB12.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="conflict: A is present in EMBL:U00023"
1981. 3367
/note="1387 bp direct repeat"
complement(2050. 2991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TNLISVAADATDPTAMTALFDREGVDLPPLEGIYLAAFAGRPVLLSDMTDNDVVAMER PKLDVASLLHRLSLKQPVKYFLLFSSISGLIGSRWLAHYTATSAFLDILGYARRLVGL PATVVAWGLWKSLADAQQDATQVSAESGLQPWTDDVAIGALPLVMSPDAPVHSVVAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WATNMENPVHFQQAIMTAGTDHRTFIEISAHPLLTQAITDTLHGTRCISIGTLQRDAD
DTVTFHTNLNNVHTVHPPHTPHPAEPHVTIPSTPWQHTRHWITTPLASTTALQHLDRN
RVTTHATGIGNTELDDWIYQLDWPTRPLTSEPGATWASSGSWLVVSDAGLSDELARLV
                                                                                                                                                                /transl_table=11
/product="putative polyketide synthase"
/protein_id="CAB36628.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(181.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TDYLATILPEFLEPEAPSGRTTADAYDEFTESELLDQLSERLRGTQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DWPLLAAAYQTRGVLRMVDDLLPAPGEVLMQESEFRKALRTCQAERRHNMLFDHVSAL
VAKAMGLLPAETLDPSAGFFQLGMDSLMSVTLQRALSDSLGEFLPASVVFDYPTVYSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WGSVIDLDASMPPELAARCILDEVASQDEKDREDQVVYRACLRRAPRLQRRTASAVSS
VKLSSGQDTTQLVIGATGNIGPHLIRQLAAMGATTIVAVSRNPSTRLLELDKNLAATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VLADPASRVEYLAPSALDHDVSTLHDLHNALRGVDNVLYAPSVSTESVDPVDPESGYR
LFHAVRRLAAAMVAGTSKPKLVVVTRNAQPVAVGERANPAHAVLWGFGRTLALEHPEI
/db_xref="GI:4455664"
/db_xref="SPTREMBL:Q9Z5K6"
/translation="MTASIGSEADLCHWLVNYLVTNIGCTPDEVDLNLSLTDLGMSSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(3886. .4965)
/note="Pfam match to entry PF00501 AMP-binding,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Phosphopantetheine attachment site, score 42.90,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RFASRVNIEVAPHNPAMDALQPQMRSELADVAPRTPTIPILST1YADLGSCPVFDAQH
                                                                                                                                                                                                                                                                                                                            codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Pfam match to entry PF00698 Acyl_transi,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="MLCB12.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  note="Pfam match to entry PF00550 pp-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="MLCB12.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .384)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     E-value
```

VRGEGAGVVVLKRLTDAQRDGDRVLAIIRGSAVNQDGRSNGLMAPNPAAQVAVLRTAY
ANAAMPTAIDVETHGTGTLLGDPIERALGAVLGRCRAEDSPLLIGAVKTNIGHLE
AAAGIAGEIKTVLAVQRGQIPPNQRFESPNLHIPFAELRKKVDKHMEWPDTGHLRRA
AVSSFGRGGTNAHVVIEGGPELIPVTECSSNTAAVSTLVVTGKTASRVAAMAGNLADWV
EGPGAEVALADVAHTLNHHRSRHAKFGTVVARDRIQAVAGLRALAGKQAPGVVGQQD
GTPGSGTVFVYSGRGSQMAGMGRQLLAADEPAFTAAVAGLEPVFVHAGFSLHDVLANG
KELVGIEQIQLGLIGMQLTLTELMRSYGVQPDLVIGHSLGEVAAAVVAGLITAEGLIR
VTATRSRLMAPLSGQGCMALLELDAVETEALTVDYSQVTLAIINSPRQTVIAGPTEQI
DELIDRVRAQNRFASRVNIEVAPHNPAMDALQPOMRSELADVAPRTPTIPILSTTYAD
LGSCPVFDAQHMATNMRNPVHFQQAIMTAGTDHRTFIEISAHPLLTQAITDTLHGTRC

20 Ъ 8 В Ş В В Ş 밁 δÃ В Ş 밁 γQ 밁 ρ В δÃ g Š 밁 Q ₽ Q Query Match Best Local Similarity 59.0 Conservative 11714 11894 11240 11300 11414 11180 11360 11474 11534 11594 11654 11774 11834 541 121 721 661 421 781 481 361 301 241 181 61 ataggaatttgegcaccaattctgggtggataccccgcggtgctcaccagcccggtgtcg 660 cgcatcgccgttgccgctttcggttccacaaggcggcgttaccgatgaacgttccgattcg 240 atototgotoogoagggactogagtacgtogtogoctatotoggoggcgttgcaggocggg 180 | 999c9t9acctcg9caacatact9accatcctcagcg9tagcgagcggggtacaggccgcg 840 TITTIGCGGCGCCCCGCCTGTTGGATGCAACTTCTTGCCACTACCCAGGCGTGTTTTTCT 11241 ttcctgcagcgcccggtcccggtggatgcacttgatggccagcgattttcacgccttttcg 720 ccaccgccaaattccgcactcgtatccttggctacccttctaccacgacatgggtttggta 600 aacgttcgggttaatttcgaacagctgatgtctggctactttgcgggataccgacgggatt CTTGACTTGAACGCGTCACTCCCGCTTCCAAAAGTCCCCCAGCCTTTTACTAGCCCGGCT 11535 gigcaacaigiigcgcggcggcccggggaaiccccgccatcaattaicgaagiigaiitg 360 cgaacgctgaatgtggcacaggagctgagccgttgtggttccacgggttgaccgcgtggtg 120 GGACTCGACCTCGGGGATGTGGCCGGAATCATCAGCGGCAGCGAACGAGTCCATATCGCA CTTGGGGTCTGTGCTCCAATGGTCGCGGGGCGAAGCTCGGTGTTGTTGAGCCCCTATGTCA 11301 CTG-----AACACGACCGTGGTGTCATGGCTTCCCTTGTTTCACGACATGGGCTTGATT 11361 AACGTTATCGCTAACGTGCAGCAAAGCATGAACGGCTATTTCGGCGATGCCGCAAAAACT ctcgatctggacgctccgaatgggtataccttcaaagaagacgagtatccatctaccgcg 420 GTGTTACGGGATTCTCAACCGATCGCTATTCTTACAACTTCATTTGTGGTTAGTGACGTG gtactgagtgattcgtcgccggtggccattctcactacatcgtctgccgtggacgacgtc 300 TTTATCGCGGTACCTCTTTCGCCACCGCAGTATGCGATTCACGACGAACGCGTTTCGGCG ATTTTGGCGCCACAGGGACTGGAATATATTATCGCGTTCTTAGGGGCTCTTCAGGCCGGA 11775 CGTTCATGCGTCCTTGCTGACGAACTCAAATTGTGTGGTGTGCCCCGGTGATCGAGTTGCA 11835 32.2%; 59.0%; 0; Score 291; DB 2; 1 Pred. No. 4.3e-52; 0; Mismatches 355; Length 34316; Indels 6; Gaps 540 11181 11475 11715 11415 11595 1;

δð

841

acgatcaagcgcttcgccgaccgctttgctcgcttcaatct

Db 11120 ACGGTGAAACGTTTCACCGAGCGCTTCGCTCGGTTCAATCT 11080

Search completed: January 12, 2001, 20:06:59 Job time: 26588 sec

١

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Title:
Perfect score:
                                                                                                                                                                                                                                            Database
                                                                                                                                                                                                                                                                                                                                             Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                               Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                            ptal number of hits satisfying chosen parameters:
 SPTREMBL_15:*

1: sp_archea:*
2: sp_bacteria
3: sp_fung1:*
4: sp_human:*
5: sp_inverteb:
6: sp_mammal:*
7: sp_mhc:*
8: sp_organel:
9: sp_phage:*
10: sp_plant:*
11: sp_rodent:
12: sp_vrus:*
13: sp_vertebr
14: sp_unclass
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 January 5, 2001, 14:30:37; Search time 115.27 Seconds (without alignments) 305.044 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                             374700 seqs, 117207915 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-461-774-6
1540
                                                                                                                                                                                                                                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 DYEQDWDGVAITLTRSQLYR.....TIKRFADRFARFNLQERVKA 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                  sp_archea:*
sp_bacteria:*
sp_fungi:*
sp_fungi:*
sp_human:*
sp_human:*
sp_mammal:*
sp_mammal:*
sp_mac:*
sp_plant:*
sp_rodent:*
sp_virus:*
sp_vertebrate:*
sp_unclassified:*
                                                                                                                                                                                                                                                                                                                                                                                                 374700
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

19	18	17	16	15	14	13	12	11	10	9	8	7	σ	5	4	'n	2	ם	Result No.
233	239	257.5	271	290	310	386.5	421	426	484	604.5	821	823	858	906.5	948	954.5	1515	1519	Score
15.1	15.5	16.7	17.6	18.8	20.1	25.1	27.3	27.7	31.4	39.3	53.3	53.4	55.7	58.9	61.6	62.0	98.4	98.6	Query Match
649	587	562	220	110	8243	1770	2297	620	637	585	411	619	583	578	584	584	582	580	Query Match Length
10	N	N	N	N	σ	N	ν	N	ν	N	N	2	N	N	ν	N	N	N	DB
Q9XHW1	Q9ZGQ2	P71605	P72116	086982	096554	Q50857	054155	P95288	053580	P95213	Q50466	P95141	Q925K5	050441	007797	053903	P71495	P96290	ID
Q9xhwl oryza sativ	Q9zgq2 burkholderi	p71605 mycobacteri	P72116 pseudomonas	O86982 mycobacteri	096554 cryptospori	Q50857 myxococcus	OS4155 streptomyce	P95288 mycobacteri	O53580 mycobacteri	P95213 mycobacteri	Q50466 mycobacteri	_	Q9z5k5 mycobacteri	O50441 mycobacteri	007797 mycobacteri	O53903 mycobacteri	P71495 mycobacteri	P96290 mycobacteri	Description

45	- 42	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
171.5	172	172.5	172.5	173	173	176.5	177	177.5	179.5	181	181.5	181.5	182.5	183	185	187	190	193.5	193.5	195	195.5	199.5	223	232
	11.2	•	•						•	•				•		•	•			•		•	•	
2611	550	2591	476	7576	522	9376	3670	8563	3317	1876	1575	584	525	3415	3643	2631	4976	7463	4450	1400	511	485	3971	544
Nυ	n UI	N	Ν	N	Ν	Ν	N	N	N	N	2	N	Ν	Ν	N	N	N	Ν	2	N	N	N	N	N
068487	Q27758	Q54959	Q50017	Q9ZGA4	Q9K3W1	085168	Q9Z4X5	Q54297	Q9RAH2	Q9R686	P94904	Q9RTR4	007169	Q9XCF3	Q9RK14	Q9RNB5	087314	Q9Z4X6	Q44928	Q9LCU0	Q9KZC1	Q9L0A2	Q9R9J1	005598
068487	Q27758	Q54959	Q50017	Q9zga4	Q9k3w1	085168	Q9z4x5	Q54297	Q9rah2	Q9r686	P94904	Q9rtr4	007169	Q9xcf3	Q9rk14	Q9rnb5	087314	Q9z4x6	Q44928	Q91cu0	Q9kzc1	Q910a2	Q9r9j1	005598
streptomyce	photinus py				streptomyce	pseudomonas	streptomyce	streptomyce	nostoc sp.	bacillus su	lysobacter.	deinococcus	mycobacteri	mycobacteri	streptomyce	microcystis	mycobacteri	streptomyce	bacillus br	mycobacteri	streptomyce	streptomyce	bacillus su	mycobacteri

ALIGNMENTS

```
RESULT P71495 ID                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ω<sub>γ</sub>
                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
밁
                               Š
                                                                                          В
                                                                                                                                    QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-97252490; PubMed-9098059; Fitzmaurice A.M., Kolattukudy P.E.; Popen reading frame 3, which is adjacent to synthase gene, is expressed as an acyl coen Mycobacterium bovis BCC.";
J. Bacteriol. 179:2608-2615(1997).
EMBL; U75685; AAB52538.1; -.
INTERPRO; IPRO0873; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P71495;
01-FEB-1997
01-FEB-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium bovis.
Bacteria; Firmicutes; Actinobacteria;
Actinomycetales; Corynebacterineae; My
NCBI_TaxID=1765;
[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PFAM; PF00501;
SEQUENCE 582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-MAY-2000 (TrEMBLrel. ACYL-COA SYNTHASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-BCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                       149
                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             147
                                                                                             209
  269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                      181
                                                                                                                                                                                                                                                                                  89
                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                             29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGYVMSHQNVRVNFEQLMSGYFADTDGI
                                                                                                                                                                                                                                                                                                                                                                                                     DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQERV
                                                                                          PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS
                                                                                                                PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS
                                                                                                                                                                                     LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI
                                                                                                                                                                                                                                                                                  RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL
                                                                                                                                                                                                                                                                                                           RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL
                                                                                                                                                                                                                                                                                                                                                                               DYEQDWDGVAITLTWSQLYRRTLNVARELSRCGSTGDRVVISAPQGLEYVVAFLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQERV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AMP-binding; 1
AA; 62930 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    02,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 1515; DB 2
Pred. No. 1e-118;
2; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                44B776D9A8EEA552 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    nt to the coenzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mycocerosic
A synthase i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             206
                                                                                                                                      240
                                                                                                                                                                                     208
                                                                                                                                                                                                                                                                                  148
                                                                                                                                                                                                                                                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                               88
                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
```

Ĉ

update)

```
RESULT
007797
ID 00
AC 00
DT 00
DT 00
DT 00
DT 00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0.039013
1D 0.039013
1D 0.039013
1D 0.039013
1D 0.010
1D 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AK COLE S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris D. & Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris D. & Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., and Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., and the state of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  053903;
053903;
01-JUN-1998
01-JUN-1998
O07797 PRELIMINARY; PRT 007797; O1-JUL-1997 (TrEMBLrel. 04, Creat 01-JUL-1997 (TrEMBLrel. 04, Last 01-JUN-2000 (TrEMBLrel. 14, Last POSSIBLE POLYKETIDE SYNTHASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Firmicutes; Actinobacteria; Actinomycetales; Corynebacterineae; M.CBI_TaxID=1773;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-JUN-2000 (TrEMBL)
HYPOTHETICAL 62.8 KI
RV1529 OR MTV035.03
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PFAM; PF00501; AMP-binding;
Hypothetical protein.
SEQUENCE 584 AA; 62829 MV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           171
                                                                                                                                                                                                                                                                                                                                         322
                                                                                                                                                                                                                                                                                                                                                                                                      291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27
                                                                                                                                                                                                                                                                                                                                                                                                      RFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DYEQDWAGVAETLTWSQLYRRMLNVAEPLRHVGATGDRAVILAPQGIEYVVGFLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                         RFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LDLDA------PNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RIAVPLPVPHAGAHDERTISVLSDTSPAVILTTSGAVDDVRECAQPQPGQSAPSIVELDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LDLDSRQRSRSPGARPTG----RDTPETAYLQYTSGSTRTPAGVMVSNKNVFANFEQIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                         324
                                                                                                                                                                                                                                                                                                                                                                                                      293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel. 06, Created)
(TrEMBLrel. 06, Last sequence update)
(TrEMBLrel. 14, Last annotation update)
62.8 KDA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62829 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62.0%; Score 954.5;
62.7%; Pred. No. 9.3
tive 35; Mismatches
                                                                                                   Created)
                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CC09FDEA5B0ABDD5 CRC64;
                                  sequence up
annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mycobacteriaceae; M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5; DB 2;
9.3e-72;
hes 63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2
```

1:

```
В
                                                                                                                                                                                                                                                                                                     RESULT
050441
    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
Matches 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=98295987; PubMed=9634230;
A Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris D. A Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., A Badcock K., Basham D., Brown D., Chillingworth T., Connor R., A Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd S., A Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., A Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., A Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J.E Taylor K., Whitehead S., Barrell B.G.;
Tocomplete genome sequence.";
L. Nature 393:537-544(1998).
EMBL; 797188; CAB10005.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Firmicu:
Actinomycetales; (NCBI_TaxID=1773; [1]
MEDLINE-98295987; pubMed-9634230; Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F. Badcock K., Basham D., Brown D., Chillingworth T., Connor R. Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., HC
                                                                                                                           Actinomycetales;
NCBI_TaxID=1773;
                                                                                                                                                                                                       01-JUN-1998 (TrEMBLrel.
01-JUN-1998 (TrEMBLrel.
01-JUN-2000 (TrEMBLrel.
01-JUN-2000 SYNTHASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM STRAIN=H37RV;
                                                                STRAIN=H37RV;
MEDLINE=98295987;
                                                                                                                                                           Mycobacterium tuberculosis.
Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                     050441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PFAM; PF00501; AMP-binding; 1
SEQUENCE 584 AA; 62840 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TUBERCULIST; Rv3826; -.
INTERPRO; IPR000873; -.
                                                                                                 SEQUENCE
                                                                                                                                                                                            RV1185C OR MTV005.21C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         147
                                                                                                                                                                                                                                                                                                                                                                   267
                                                                                                                                                                                                                                                                                                                                                                                                                             207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27
                                                                                                                                                                                                                                                                                                                     Ç
                                                                                                                                                                                                                                                                                                                                                                                   AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                               PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LIAVPLSAPLGGASDERVDAVVRDAKPNVVLTTSAIMGDVVPRVTPPPGIASPPTVAVDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                   AAPNFAFELTAAKAIDDDLAGLDLGRIKTILCGSERVHPATLKRFVDRFSRFNLRE
                                                                                                                                                                                                                                                                                                                                                                                                                            PPLDLFIMSWLPFYHDMGLVLGVCAPIIVGCGAVLTSPVAFLQRPARWLQLMAREGQAFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LDLDSPIRSNIVDDSLQTTAYLQYTSGSTRTPAGVMITYKNILANFQQMISAYFADTGAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                 FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Corynebacterineae; Mycobacteriaceae; Mycobacterium
                                                                                                                                             Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61.6%;
                                                                                                                                                                                                                         06,
06,
14,
                                                                                                                                                                                                                                      Created)
Last sequ
                                                                                                                                                                                                                         Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 948; DB 2;
Pred. No. 3.2e-71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99639AB9BEEA39EF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                             a; Actinobacteridae;
Mycobacteriaceae; N
                                                                                                                                                                                                                                                                                       578
                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                         update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 584;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                             Mycobacterium
                                                Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   s.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  D.,
                                                Ď.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
```

```
Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
밁
                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                       Q9Z5K5
Q9Z5K5;
Q1-MAY-1999
                                                                                                                                                                                                                                                                           PUTATIVE AC MLCB12.03C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complete genome sequence.";
Nature 393:537-544(1998).
EMBL; ALO10186; CAA15862.1;
TUBERCULIST; RV1185c; -.
INTERPRO; IPRO00873; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Oliver S., Osborne J., Quail M.A., Rajandr Rutter S., Seeger K., Skelton S., Squares Taylor K., Whitehead S., Barrell B.G.; "Deciphering the biology of Mycobacterium
                                "Use of an ordered cosmid librar of Mycobacterium leprae.";
Mol. Microbiol. 7:197-206(1993).
EMBL, AL035480; CAB36629.1;
                                                                                                                             SEQUENCE FROM N.A. James K.D., Parkhill Submitted (FEB-1999)
                                                                                                                                                                                                                                                             Mycobacterium leprae.
                                                                                                                                                                                                                                                                                                01-MAY-1999 (TrEMBLrel.
01-MAY-1999 (TrEMBLrel.
01-MAY-2000 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PFAM; PF00501; AMP-binding; 1 SEQUENCE 578 AA; 62756 MW;
                                                                                MEDLINE=93188700; PubMed=8446027; Eiglmeier K., Honore N., Woods S.
                                                                                                                                                                                Submitted
                                                                                                                                                                                                                           Actinomycetales;
NCBI_TaxID=1769;
                                                                                                                                                                                                                                                   Bacteria; Firmicutes;
                       INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                           266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              y Match
Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ب
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                      AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AIAVPLSVPQIGSHDERVSAVLADASPSVILTTSAVAEAVAEHIHRPNTNNVGPIIEIDS 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DYEQDWAGITETLTWSEVFRRTRIVAHEVRRHCTTGDRAVILAPQGLAYIAAFLGSMQAG
                                                                                                                                                                                                                                                                                                                                                                                                         AAPNFAFELAVRKTTDADIEGLDLGNVLGITSGAERVHPNTLSRFCNRFAPYNFRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPDTTIVSWLPFYHDMGLVLGIIAPILGGYRSELTSPLAFLQRPARWLHSLANGSPSWS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LDLTG-NSPSFRVKDLPSAAYLQYTSGSTRAPAGVMISHRNLQANFQQLMSNYFGDRNGV 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   al Similarity
175; Conser
        PRO; IPR000873;
PF00501; AMP-b
                                                                                                                                                                                                                                                                                       ACYL-COA
                                                                                                                                                                             (FEB-1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jagels K.,
Osborne J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
AMP-binding;
AA; 63212 M
                                                                                                                                                                                                                                                                                     MBLrel. 10,
MBLrel. 10,
MBLrel. 13,
MBLrel. 13,
                                                                                                                                                                                                                                        Corynebacterineae;
                                                                    cosmid library
                                                                                                                               to,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               58.9%;
59.1%;
                                                                                                                                                                               ç
                                                                                                                                                                                                                                                   Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Krogh A.,
Quail M.A
                                                                                                                                                                               the
                                                                                                                               Barrell B.G., Rajandream M.A.;
the EMBL/GenBank/DDBJ databases
 ₹.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    50;
                                                                                                                                                                               EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                  Last sequence update)
Last annotation update
                                                                                                                                                                                                                                                                                                                          Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 906.5;
Pred. No. 9.6e
50; Mismatches
                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                  S.A.,
 94BB630C2DDF0137 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               698FE8FE9E4BFA2F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               McLean
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             906.5;
No. 9.6
                                                                        ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cLean J., Moule S.
Rajandream M.A., l
Squares S., Sqares
                                                                                                                                                                                                                                        Mycobacteriaceae;
                                                                      Caudron
deduce t
                                                                                                                                                                                                                                                   Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                               AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               . 6e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DВ
                                                                the
                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   70;
                                                                                                                                                                               databases
                                                                   genomic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rogers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₹.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Murphy
ogers J
                                                                                                                                                                                                                                        Mycobacterium
                                                                      organization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
```

```
Вþ
                            δÕ
                                                                                     δÃ
 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                      Query Match
Best Local S
Matches 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harri Gordon S.V., Eiglmeier K., Gas S., Barry C. E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroy. Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston Taylor K., Whitehead S., Barrell B.G.;
                                                                                                                                                                                                  Hypothetical SEQUENCE 61
                                                                                                                                                                                                                           PFAM; PF00501; AMP-binding; 1.
                                                                                                                                                                                                                                                           EMBL; Z83018; CAB05426.1; -. TUBERCULIST; Rv2950c; -.
                                                                                                                                                                                                                                                                                       "Deciphering the biology of Mycobacterium tuberculosis from complete genome sequence.";
Nature 393:537-544(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; MCBI_TaxID=1773;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-MAY-1997 (TrEMBLrel. 03, Created)
01-MAY-1997 (TrEMBLrel. 03, Last sequence update)
01-CCT-2000 (TrEMBLrel. 15, Last annotation updat
HYPOTHETICAL 67.4 KDA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RV2950C OR MTCY349.40.
Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P95141
                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=98295987; PubMed=9634230;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                      Local Similarity 56.2
nes 168; Conservative
                                                           64
                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                          DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
LIAVPLPVPQFGIHDERISSALRDSAPSIILTTSSVIDEVTTYAPHACAAQGQSAPIVVA
                  RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDV---VQHVARRPGESPPSIIE 117
                                                          DYDTDPAGETETVTWMQVHRRAMIVAEELWIYASSGDRVAILAPQGLEYIIAFMGVLQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAPNFAFELAVRRTSDDDMNGLDLGDVAGIISGSERVHIATVKRFTERFARFNLSPSV 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQERV 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FIAVPLSPPQYAIHDERVSAVLRDSQPIAILTTSEVVSDVAKYACEQDGWNAPSVIEIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DYGSDPKGFVESLTWSQVYMRSCVLADELKLCGVPGDRVAILAPQGLEYIIAFLGALQAG
                                                                                                                                                                                                                                            IPR000873;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                 protein
                                                                                                                                                                                                67446 MW;
                                                                                                                                    53.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        55.7%;
57.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          42;
                                                                                                                    Score 823; DB
Pred. No. 1e-6
41; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 858; DB 2;
Pred. No. 1.1e-63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                ED3F2E536CAF24B5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                       e 823; L.
No. 1e-60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A
                                                                                                                                                    ۲,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                      84;
                                                                                                                                                  Length 619;
                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                 Holroyd
                                                                                                                      6,
                                                                                                                                                                                                                                                                                                                                                                                                                                               Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                           123
                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                 s,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                               D.,
                                                                                                                      2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1;
```

SQ SQ

FADD30

OR RV0404 OR MTCY04D9.17-MTCY22G10.00

```
GE DT DAC
                                                                        RESULT
P95213
                                                                                                                                        Ş
                                                                                                                                                               망
                                                                                                                                                                                    δÃ
                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                            Matches
                 P95213;
P95213;
01-MAY-1997
01-AUG-1998
01-JUN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q50466;
Q50466;
01-NOV-1996
                                                                                                                                                                                                                                                                                                                                                                                               INTERPRO; IPRO00873; PFAM; PF00501; AMP-b: SEQUENCE 411 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                               Submitted (SEP-1994) to the EMBL; U00024; AAA50932.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Actinomycetales; Corynebacterineae; NCBI_TaxID=1773;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           U0002Q.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Robison K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis.
                                                                                                                  301 QISSAPNFGFELAVRRTSDDDMAGLDLGHVRTIVTGAERVNVATLRRFTERFAPFNLSGR
                                                                                                                                                               244
                                                                                                                                                                                                           184
                                                                                                                                                                                                                                                      124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           184
                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                 64
                                                                                                                                                                                                                                                                                                                    1 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                   9
                                                                                                                                                                                                                                                   DYDTDPAGFTETVTWWQVHRRAMIVAEELWIYASSGDRVAILAPQGLEYIIAFWGVLQAG
                                                                                                                               AFSAAPNFAFELAARRTIDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQER
                                                                                                                                                                          VDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADT
                                                                                                                                                                                                                                                                          RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDV---VQHVARRPGESPPSIIE 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EKVP---STPVSWLPFYHDMGLMLGIILPMINQDTAVLMSPMAFLQRPARWMQLLAKHRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QISSAPNFGFELAVRRTSDDDMAGLDLGHVRTIVTGAERVNVATLRRFTERFAPFNLSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EKVP---STPVSWLPFYHDMGLMLGIILPMINQDTAVLMSPMAFLQRPARWMQLLAKHRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VDALDLSSSRALDPTRFERPSTAYLQYTSGSTRAPAGVVLSHKNVITNCVQLMSDYIGDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (JAN-1994)
                 (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                                            Conservative
                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                 AMP-binding; 1.
AA; 45242 MW;
                                                                                                                                                                                                                                                                                                                                                     53.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                          to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ç
                 03,
07,
14,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01,
01,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
Last sequence update)
Last annotation updat
                 Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                     Score 821; DB 2; Pred. No. 8.5e-61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                 DADD8165111AE2B0 CRC64
                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                               585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  411
                                                             ĀΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                                           databases
                                                                                                                                                                                                                                                                                                                                                              Length 411;
                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium.
                                                                                                                                                                                                                                                                                                                                           6
                                                                                                                                                                                                                                                                                                                                          Gaps }
                                                                                                                                                                                                                                                                                                 123
                                                                                                                                                                                                           243
                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           243
                                                                                                                                                                                                                                                                                                                                           2
```

```
RESULT
O53580
ID
O5050
AC
O500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Βb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCO
OCCOOC
OCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCOOC
OCCO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity
Matches 133; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=98295987; PubMed=9634230; Garnier T., Churcher C., Harris Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Bavies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J. Taylor K., Whitehead S., Barrell B.G.;
"Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence.";
Nature 393:537-544(1998).
                                                                                                                                                                                                                                                                                                                                                       01-JUN-1998 (TrEMBLrel. 06, 01-JUN-1998 (TrEMBLrel. 06, 01-JUN-2000 (TrEMBLrel. 14, PUTATIVE POLYKETIDE SYNTHASI
                                                                                                                                                                                                                                             Mycobacterium tuberculosis.
Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (JUN-1998) to the EMBL; 284725; CAB06604.1; TUBERCULIST; RV0404; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis.
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                          SEQUENCE FROM STRAIN=H37RV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-H37RV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
    MEDLINE=98295987; PubMed=9634230;
                                                                                                                                                        Actinomycetales;
NCBI_TaxID=1773;
                                                                                                                                                                                                                                                                                                                                  RV3801C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=1773;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HEGGAPRLPSSVVSWLPLYHDMGLMVGLFIPLFVGCPVILTSPEAFIRKPARWMQLLAKH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CAGWTPVPLPEPLGSLRDKRTGLAVLDCAADVVLTTSQAETRVRATIATHGASVTTPVIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VDLLDLDAPNGYTFKEDEYPS--TAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QAPFSAAPNFAFDLAVAKTSEEDMAGLDLGHVNTIINGAEQVQPNTITKFLRRFRPYNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LD--TLDEPSGDNCDLDSQLSDWSSYLQYTSGSTANPRGVVLSMRNVTENVDQIIRNYFR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QAGRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DYDTKTGDQIDRMTWSQLYSRVTAVSAYLISYGRHADRRRTAAISAPQGLDYVAGFLGAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDR----VVISAPQGLEYVVAYLGAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PF00501; AMP-bin
                                                                                                                                                                                                                                                                                                                                  OR MTV026.06C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AMP-binding; 1
AA; 63843 MW;
                                                                                                                                                                                                   Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                SYNTHASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           39.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         47;
                                                                                                                                                                                                                                                                                                                                                                                                      Last
Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 604.5; DB 2;
Pred. No. 1.9e-42;
7; Mismatches 112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B16A77089F760F18
                                                                                                                                                                                                                                                                                                                                                                                                      sequence update)
annotation update)
                                                                                                                                                                                                   Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            637
                                                                                                                                                                                                                                             Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        β
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω
```

```
Ωy
     ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 115
                    STRAIN-H37RV;
MEDLINE=98295987; PubMed=9634230;
Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harri
Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F.,
Badcock K., Basham D., Brown D., Chillingworth T., Connor R.,
Badcock K., Basham D., Brown D., Chillingworth T., Connor R.,
Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroy(
Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L.,
Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harr Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroy. Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston Taylor K., Whitehead S., Barrell B.G.;
"Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence.";
Nature 393:537-544(1998).
EMBL; AL022076; CAAL7865.1; -.
                                                                                                                                                                                                                                                                               01-MAY-1997 (TrEMBLrel. 03, CT
01-MAY-1997 (TrEMBLrel. 03, La
01-OCT-2000 (TrEMBLrel. 15, La
HYPOTHETICAL 66.3 KDA PROTEIN.
RV1925 OR MTCY09F9.39C.
                                                                                                                                                                                                                                                                Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PFAM; PF00501; AMP-binding; 1 SEQUENCE 637 AA; 69231 MW;
                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                Actinomycetales;
NCBI_TaxID=1773;
                                                                                                                                                                                                                                                  Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                     P95288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TUBERCULIST; Rv3801c; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  340 GLKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   293 NLQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SDFHAFSAAPNFAFELAA-RRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWHHLMA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ETGGTFSAAPNFAFEHAAVRGVPRDDEPPLDLSNVKGILNGSEPVSPASMRKFFEAFAPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     G-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VPTEVAATWQQPEANEETVAYLQYTSGSTRIPSGVQITHLNLPTNVVQVLNALEGQEGDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RIAVPLEDPAEPGHVGRLHAVLDDCAPSTILTTTDSAEGVRKFIRARSAKERPRVIAVDA 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DFSTERDGVARDILWSDFSARNRAVGARLQQVTQPGDRVAILCPQNLDYLISFFGALYSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al Similarity 37.1
115; Conservative
., Seeger K., Skelton S., Squares
., Whitehead S., Barrell B.G.;
ring the biology of Mycobacterium
                                                                                                                                                                                  FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IPR000873; -
                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VSWLPFFHDMGLITVLLASVL-GHSFTFMTPAAFVRRPGRWIRELARKPG
                                                                                                                                                                                                                                   Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 31.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     51;
                                                                                                                                                                                                                                                                                                                  Created)
Last sequence
Last anno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 484; DB 2;
Pred. No. 2.7e-32;
1; Mismatches 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0A3A86CED9AE0EDC
                                                                                                                                                                                                                                                                                                                   annotation
                                                                                                                                                                                                                                                                                                                                 sequence
                                                                                                                                                                                                                                 Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                   620
                                                                                                                                                                                                                                                  Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                    Hol royd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Holroyd
                                                                                                                                  Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       J.E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    177
                                                                                                                                  U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
```

```
RESULT
054155
ID 05
AC 05
DT 01
DT 01
DT 01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
 밁
                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RT DR SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                           01-JUN-1998 (TrEMBLre
01-JUN-1998 (TREMBLre
01-JUN-2000 (TREMBLre
POLYKETIDE SYNTHASE.
SC3F7.12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complete genome sequence.";
Nature 393:537-544(1998).
EMBL; 284498; CAB06501.1; -.
HSSP; P08659; 1LCI
TUBERCULIST; Rv1925; -.
INTERPRO; IPR00873; -.
PPAM; PP00501; AMP-binding; 1.
                                                                                                                                                                                                                                                                                                               054155;
EMBL;
                                                          STRAIN=A3(2);
MEDLINE=97000351; PubMed=8843436;
                                                                                                          Submitted
                                                                                                                                                                                                                                      Streptomyces coelicolor.
Bacteria; Firmicutes; Actinobacteria;
          "A set of ordered cosmids and a detaile
"A set of ordered cosmids and a detaile
the 8 Mb Streptomyces coeficolor A3(2)
Mol. Microbiol. 21:77-96(1996).
                                                                                    SEQUENCE FROM N.A.
                                                                                                                              STRAIN=A3(2);
                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                              Submitted
                                                                                                                                                                                    STRAIN-A3(2
                                                 Redenbach M., Kieser H.M.,
                                                                                                                      Parkhill
                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hypothetical protein,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                 346
                                                                                                                                                                                                                                                                                                                                                                                                                            290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          _
                                                                                                                                                                                                                                                                                                                                                                                 ۲
                                                                                                                                                                                                                                                                                                                                                                                                      г
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                          RVVTAAPNFAYEWAAQRGLPAQGDDV----DLSNVVLII-GSEPVSIDAVTTFNKAFAPYG
                                                                                                                                                                                                                                                                                                                                                                                                                                               HAFSAAPNFAFELAARR----TTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPPNSALVSWLPFYHDMGL-VIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDF---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IPDREGELFVPVEMDIDAVSHLQYTSGSTRPPVGVEITHRAVGTNLVQMILSI-----DL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TVAVPLFAPELPGHAERLDTALRDSEPAVILTTAAAKNAVEGFLNNVPRLRKPTVLVIDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DHARSAAGCALEVTWTQFGMRLAAIGAHVQRFAGPGDRVAILAPQGIDYVCGFYAAIKAG
AL021409;
                                                                                                                                                                                                                                                                                                                                                                                 346
                                                                                                         J., Barrell
d (JAN-1998)
                                                                                                                                                              , Harris D.;
(JAN-1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   620
                                                                                                                                                                                                                                                                                 (TrEMBLrel.) (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AA;
                                                                                                                                                                                                                             Streptomycineae;
                                                                                                                                                                       D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   66327
                                                                                                         B.G., 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       27.7%;
                                                                                                                                                              ç
                                                                                                                                                              the
                                                                                                                                                                                                                                                                                 06,
14,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             55;
                                                                                                         Rajandream M.A.;
e EMBL/GenBank/DDBJ
                                                    Denapaite
                                                                                                                                                                                                                                                                                 Created)
Last sequence up
                                                                                                                                                              EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score
Pred.
                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6858376B5F25BBC6 CRC64;
                                detailed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                            Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       426;
No. 1.
                                                    D.,
                                                                                                                                                                                                                                       Actinobacteridae;
                      chromosome
                                                                                                                                                                                                                                                                                                                            AA
                               genetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 2;
.9e-27;
                                                      Eichner
                                                                                                                                                                                                                                                                                           update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120;
                                                                                                                                                                                                                                                                                 update)
                                                                                                          databases
                                                                                                                                                              databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                               and
                                                    Α.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                           Streptomyces
                                                      Cullum
                               physical map
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18;
                                                   J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
```

C

```
RESULT
Q50857
 Qy
                                                                                                                                                                                                                                                                                                                                                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                        Q50857;
Q50857;
01-NOV-1996
01-NOV-1996
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTERPRO;
INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HSSP; P257
INTERPRO;
INTERPRO;
INTERPRO;
          MEDLINE=97090395; PubMed=8936303;
Pospiech A., Bietenhader J., Schupp T.;
"Two multifunctional peptide synthetases and an O-me are involved in the biosynthesis of the DNA-binding
                                                                                               MEDLINE=96032006; PubMed=7551044;
Pospitech A., Cluzel B., Bietenhader J., Schupp T.;
"A new Myxococcus xanthus gene cluster for the biosynthesis antibiotic saframycin Mx1 encoding a peptide synthetase.";
Microbiology 141:1793-1803(1995).
                                                                                                                                                              SEQUENCE FROM N.A. STRAIN=DM504-15;
                                                                                                                                                                                                                                                   SAFB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PFAM; PF00501; AMP-binding; 1.
PFAM; PF00550; pp-binding; 1.
PFAM; PF00559; pp-binding; 1.
PFAM; PF00598; Acyl_transf; 1.
PRINTS; PR00154; AMPBINDING
PROSITE; PF00599; AA_TRANSFER_CLASS_2;
PROSITE; PS00606; B_KET0ACYL_SYNTHASE;
PROSITE; PS0075; ACP_DOMAIN; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PFAM; PF00109; ketoacyl-synt;
PFAM; PF00222; aminotran_2; 1
antitumour agent
                                                             SEQUENCE FROM N.A. STRAIN=DM504-15;
                                                                                                                                                                                                                        Bacteria;
                                                                                                                                                                                                                                       Myxococcus xanthus
                                                                                                                                                                                                                                                               SAFRAMYCIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Transferase
SEQUENCE
                                                                                                                                                                                                 NCBI_TaxID=34;
                                                                                                                                                                                                              Myxococcales;
                                                                                                                                                                                                                                                                                                                                                                                       284
                                                                                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                                       232
                                                                                                                                                                                                                                                                                                                                                                                                                                                               177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Y Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         52
                                                                                                                                                                                                                                                                                                                                                   13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5
                                                                                                                                                                                                                                                                                                                                                                                                            HAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DLDAPNGYTFKED---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DTDGTSVAWTYRELDLHAREVATHLRHAGVGQGPVLLLHPPGLDYLAAFFGCLYAGAVAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAGRIAV
                                                                                                                                                                                                                                                                                                                                                                                      ASTSVAPNEGFEQCLRRITPAQRAGLDLSRWRLALNGAEPIRPDTLDRFAEYFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                  TDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DLYTGESTTAWEDPGATARSLAFLQYTSGSTAAPKGVMVEHGNLVRNLRSIHLRLGHDAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PAYPPDNARFGQTVPRLAAIARDCAATHALTTRRVRETVAADGTGRVGTELDGVRWLVTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PLSVPQG----GVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ); IPR000794; -.
); IPR000794; -.
); IPR000873; -.
); IPR001227; -.
IPR001917; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IPR000255;
IPR000794;
IPR000873;
                                                                                                                                                                                                                          Proteobacteria;
                                                                                                                                                                                                                                                            6 (TrEMBLrel. 01, 06 (TrEMBLrel. 01, 10 (TrEMBLrel. 15, 10 (TREMBLREL 15, 10 MX1 SYNTHETASE B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                      SGMVSWLPPYHDMGLIGGILTPVYGGFPAHLMAPMTFVQRPLLWLETLSRTG
                                                                                                                                                                                                             teobacteria; delta
Cystobacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aminotran_2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
saframycin Mx1 from Myxococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -EYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFE--QLMSGYFAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       38;
                                                                                                                                                                                                                                                                         Last sequence up
                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ž
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score
Pred.
                                                                                                                                                                                                             subdivision; Myxobacteria;
Myxococcaceae; Myxococcus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C67B58461535EE46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ي 421;
اي ع. ع. ز
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     UNKNOWN_1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
.2e-26;
                                                                                                                                                                                                                                                                                                                          A
                                                                                                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        133;
ding antibiotic xanthus.";
                         O-methyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16;
                                                                                                                          ōť.
                                                                                                                          the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       231
                                                                                                                                                                                                                                                                                                                                                                                                                                        283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4.
```

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ДЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                  096554
                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                           RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                               HSSP; P28304; 1QOR.
INTERPRO; IPR000255; -
INTERPRO; IPR000794; -
INTERPRO; IPR000873; -
INTERPRO; IPR001227; -
INTERPRO; IPR001227; -
              PFAM;
                                                                                                    Zhu G., Marchewka M.J., Woods K.M., Upton "Characterization of a type I FAS gene in Cryptosporidium parvum."; Submitted (AUG-1998) to the EMBL/GenBank/IEBMBL; AF088293; AAC99407.1; -.
                                                                                                                                                                                                                                                                     01-MAY-1999 (TrEMBLrel.
01-MAY-1999 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROSITE;
PROSITE;
PROSITE;
PROSITE;
                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                          Eukaryota; Alveolata; Apicomplexa; Cryptosporidiidae; Cryptosporidiim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERPRO;
PFAM; PF00
                                                                                                                                                                                                                                    Cryptosporidium parvum
                                                                                                                                                                                                                                               TYPE I FATTY FAS1.
                                                                                                                                                                                                                                                                                                         096554;
                                                                                                                                                                                                                                                                                                                    096554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Microbiology 142:741-746(1996).
EMBL; U24657; AAC44128.1; -
HSSP; P14687; 1AMU
                                                                                                                                                                 STRAIN-KSU-1
                                                                                                                                                                                                  NCBI_TaxID=5807;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRINTS; PRO0154; AMPBINDING.

PROSITE; PS00012; PHOSPHOPANTETHEINE; UNKNOWN_1.

PROSITE; PS00455; AMP_BINDING; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                             225
                                                                                                                                                                                                                                                                                                                                                                                285
                                                                                                                                                                                                                                                                                                                                                                                                    248
                                                                                                                                                                                                                                                                                                                                                                                                                                                   188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                           14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25 VAQELSRCGSTGDRVVISAPQGLEYYVAYLGALQAGRIAVPLSVPQGGVTDE---RSDSV 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPRO; IPRO00255; -. REPRO; IPRO001242; -. REPRO; IPRO001242; -. REPRO; IPRO02114; -. REPRO; IPRO02114; -. REPRO501; AMP-binding; 1. PF00568; DP-binding; 2. PF00668; DUF4; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                         PF00107;
PF00109;
PF00501;
                                                                                                                                                                                                                                                                                                                                                                             ELCVRKISDEQKAGLDLSSWELAFCGAEPIRPDTLEAFSKAF
                                                                                                                                                                                                                                                                                                                                                                                                   ELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LSGDSVAFLQYTSGSTADPKGVVLTHRNLMHNLSVIHERFQLNRG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ARDSRASVVLTTS-----FLQGLAGAMFELAPELGELSWV---ATDGIALEEAGAWKPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLLDLDAPNGYTFKED-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IAARLQADGRVGERALLLYAPGPEYVAAFFGCLYAGVVAVPVYPPDTARLERSLLRLRTV 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -EYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFE-----QLMSGYFADTDGIPPPNSAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PS00455; AMP_BINDING; 1.
PS00589; PTS_HPR_SE; UNKNOWN_1.
PS50075; ACP_DOMAIN; 2.
1770 AA; 192495 MW; 545AC943B6A1CF1E CRC64;
                                                                                                                                                                                                                                                         (TremBLrel. 10,
(TremBLrel. 10,
(TremBLrel. 15,
Y ACID SYNTHASE.
                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
; adh_zinc; 3.
; ketoacyl-synt; 3
; AMP-binding; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             25.1%;
35.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  39;
                                                                                                                   EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                     Created)
Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches 107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         386.5; DB 2;
No. 1.7e-23;
                                                                                                                                                                                                                        Coccidia;
                                                                                                                                                                                                                                                                                                                    8243
                                                                                                                                                                                                                                                                                                                    A
                                                                                                                                         S.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 2;
                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                         Eimeriida;
                                                                                                                                        ., Keithly parasitic
                                                                                                                   databases
                                                                                                                                                                                                                                                                                                                                                                                                    289
                                                                                                                                                                                                                                                                                                                                                                             326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1770;
                                                                                                                                                    c,
                                                                                                                                          protozoon
                                                                                                                                                    ċ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            134
                                                                                                                                                                                                                                                                                                                                                                                                                           284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6
```

```
RESULT
086982
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ДЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DR DR DR DR DR DR DR DR DR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
NON_TER
NON_TER
SEQUENCE
                                                                                                                                                                                                                                     01-NOV-1998 (TrEMBLrel. 08, Created)
01-NOV-1998 (TrEMBLrel. 08, Last sequence update)
01-NOV-1998 (TrEMBLrel. 08, Last annotation update)
HYPOTHETICAL 11.8 KDA PROTEIN (FRAGMENT).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PEAM; PE00550; pp-binding; 4.

PEAM; PE00698; ACYL_transf; 2.

PROSITE; PS00012; PHOSEHPDANTETHEINE; UNKNOWN_2.

PROSITE; PS00455; AMP_BINDING; UNKNOWN_1.

PROSITE; PS00606; B_KETOACYL_SYNTHASE; UNKNOWN_2.

PROSITE; PS00606; ACP_DOMAIN; 4.

SEQUENCE 8243 AA; 920824 MW; F5A1BC8E4B3E3E7.
                                                  tension.";
Gene 213:107-117(1998).
EMBL: U64610; AAC27980.1;
                                                                                         Imboden P., Schoolnik G.K.; "Construction and characterization tuberculosis cDNA library of genes
                                                                                                                                                                                    Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; MCBI_TaxID=1773;
                                                                                                                                                                                                                                                                                               086982;
                                                                                                                                                                                                                                                                                                             086982
                                      Hypothetical protein.
                                                                                                                                 STRAIN=ATCC 51910;
MEDLINE=98296259; PubMed=9630551;
                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                             Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                             425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            245
                                                                                                                                                                                                                                                                                                                                                                                                        267
                                                                                                                                                                                                                                                                                                                                                                                                                                    365
                                                                                                                                                                                                                                                                                                                                                                                                                                                              207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                        15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6 WDGVAITLTRSQLYRRTLNVAQELS-----RCG-STGDRVVISAPQGLEYVVAYLGALQA 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GIVAVPVYPPDPMRGQSEIQRFCDIKQASETNISLTCTSYMRSIEIAKTMSTDKRFKSIR
                                                                                                                                                                                                                                                                                                                                                                             VFAILSGAEPIRKTTIDRFTEAFKSVGIKHNV
                                                                                                                                                                                                                                                                                                                                                                                              GRIAVPLSVP---QGGVTDERSDSVLSDSSPVAILTTSS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WIGSNGDIKKKFTYREFFEKVVELSWYLSKKLGIKAGDKVILCYTPGYDFVIAFT: CLVS 127
                                                                                                                                                                                                                                                                                                                                                                                                                                  LFFGCNIFQMSPIDFIKKPYLWMQCMDKYNCSVSGAPNFAFEVVVRKTPKEILNQLNLKH
                                                                                                                                                                                                                                                                                                                                                                                                                                                           ILGGYPAVLTSPVSFLORPARWMHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NEFGEEKNIMSLNDIKYDKLYLYMSIINKVLYKNTMSSASVFSWLPVYHDMGLIGFFCTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PKGVMVTHGNLLYNIHICISSYSFPSVLEEHYKNELDSIPAGITVLKKNELTEDELSFIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PAGVVMSHQNVRVNF EQLMSGYF-----ADTDG I PP------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATDNLKIRKEEYINEVQKAINDIILND---SNHFDFLGFDFNINTVAFLQFTSGSTSQ 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --AVDDVVQHVARRPGESPPSIIEVDLLDLDAPNGYTFKEDEY--PSTAYLQYTSGSTRT 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
  110
             110
                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
  A
            110
11763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20.1%;
24.2%;
 MW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 310;
Pred. No. '
                                                                                                                                                                                                                                                                                                             PRT;
768A68A8782A8C8A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             F5A1BC8E4B3E3E7C
                                                                                          of a parti
                                                                                                                                                                                                                                                                                                            110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----PNSALVSWLPFYHDMGLVIGICAP
                                                                                                                                                                                                                                                                                                                                                                             456
                                                                                                                                                                                                                                                                                                                                                                                                        298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4e-16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    UNKNOWN_2
                                                                                          partial essed at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                             Ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5
                                                                                                        Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                             reduced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                  Mycobacterium
                                                                                           oxygen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                    424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            95
```

Query Match
Best Local Similarity
Matches 57; Conserv

Conservative

13;

Mismatches

36;

Indels

2;

Gaps

18.8%; 52.8%;

Score 290; Pred. No. 3.

DB 2; .9e-17;

Length 110;

Search completed: January 5, 2001, 14:30:43 Job time: 335 sec

Ŀ

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Searched
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OM protein - protein search, using sw
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ptal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      90
      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
    1448
9292
869
1178.5
1176.5
1170.5
1170.5
1170.5
1170.5
1170.5
1170.5
1170.5
1170.5
1170.5
1163.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
1153.5
11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query
Match
                          BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-461-774-6
1540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 5, 2001, 14:31:12; Search time 35.06 Seconds (without alignments) 276.333 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SwissProt_39:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             88757 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GenCore version Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DYEQDWDGVAITLTRSQLYR.....TIKRFADRFARFNLQERVKA 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
    DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                32294092 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gapext 0.5
YMAZ_MYCBO
MASC, MYCLE
YE21_MYCTU
YT30_MYCTU
YT30_MYCTU
YD45_MYCTU
YD45_MYCTU
YD45_MCBR
GRSB_BACBR
GRSB_BACBR
GRSB_BACBR
GRSB_BACBR
LUC1_PHOPY
LCFA_BACLI
ACSA_CBACLI
ACSA_CBACLI
ACSA_CBACLI
4CL1_PETCR
AAS_ECOLI
HMP2_YEREN
TYCA_BACBR
ACCLBACLI
ACVS_NOCLA
CAIC_ECOLI
ACVS_NOCLA
CAIC_ECOLI
TYCA_BACSU
HT51_COCCA
PF51_BACSU
HT51_COCCA
PF51_BACSU
ACSA_ERENI
SRF1_BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             : 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       88757
  050200

050200

050200

050200

050200

0110976

0110976

030409

P14688

P149806

P498062

P49864

P46450

P4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Description
                                                                                                                                                                                                                                                                                                   9 photinus py
7 bacillus su
6 b bacitraci
2 bacillus su
4 cephalospor
6 haemophilus
9 homo sapien
8 vibrio angu
b bacitraci
                                                                                                                                                                                                                                                                                                                                                                                                                                                    8 mycobacteri
0 mycobacteri
6 mycobacteri
5 mycobacteri
5 mycobacteri
5 bycobacteri
2 byramicidi
2 escherichia
6 bacillus su
4 homo sapien
9 photinus py
1 bacillus su
2 petroselinu
3 petroselinu
9 escherichia
3 yersinia en
5 bacillus li
7 bacillus li
3 nocardia la
2 escherichia
8 b tyrocidin
7 bacillus su
5 cochliobolu
5 bacillus su
6 cochliobolu
5 bacillus su
8 emericella
6 bacillus su
```

130.5 8.5 1278 1 DHBF_BACSU 130.5 8.5 2560 1 PPS2_BACSU 128.5 8.3 669 1 ACSA_PENCH 126.5 8.2 4447 1 PKSK_BACSU 126 8.2 3587 1 SRF2_BACSU 125 8.1 543 1 FAT2_YEAST 124.5 8.1 543 1 FAT2_YEAST 124.6 8.1 563 1 4CL_ORYSA 124.8 1.1 563 1 ACSA_SYNY3 124.8 1.1 1098 1 GRSA_BACBR 123.5 8.0 2555 1 PPS3_BACSU 122.7 9.1293 1 ENTF_ECOLI 120.5 7.8 545 1 4CL2_SOLTU	8.5 1278 1 8.5 2560 1 8.3 669 1 8.2 4447 1 8.2 3587 1 8.1 543 1 8.1 563 1 8.1 1098 1 7.8 1255 1 7.8 545 1	45	44	43	42	41	40	39	38	37	36	35	34
15/8 1 15/8 1 669 1 4447 1 3583 1 543 1 563 1 1098 1 12955 1 545 1	1278 1 DHBF_BACSU P45745 2560 1 PPS2_BACSU P39846 669 1 ACSA_PENCH P36333 4447 1 PKSK_BACSU P40803 3587 1 SRF2_BACSU Q04747 543 1 FAT2_YEAST P38137 543 1 4CL_ORYSA P17814 653 1 ACSA_SYNY3 Q55404 1098 1 GRSA_BACSR P14687 1098 1 GRSA_BACSR P14687 1293 1 ENTF_ECOLI P31685	120.5	122	123.5	124	124	124.5	125	126	126.5	128.5	130.5	130.5
	1 DHBF_BACSU P45745 1 PPS2_BACSU P3846 1 ACSA_PENCH P36333 1 SRF2_BACSU P40803 1 SRF2_BACSU P40803 1 SRF2_YEAST P38137 1 FAT2_YEAST P38137 1 4CL_ORYSA P17814 1 ACSA_SYNY3 Q55404 1 GRSA_BACSU P14687 1 PPS3_BACSU P14687 1 PPS3_BACSU P38434 1 GRSA_ECSU P14687 1 PPS3_BACSU P384685	7.8	7.9	8.0	8.1	8.1	8.1	8.1	8.2	8.2	8.3	8.5	8.5
1 DHBF_BACSU 1 PPS2_BACSU 1 ACSA_PENCH 1 ACSA_PENCH 1 SRF2_BACSU 1 FAT2_YEAST 1 4CL_ORYSA 1 ACSA_SYNY3 1 GRSA_BACBR 1 GRSA_BACBR 1 GRSA_BACBR 1 ACSA_SYNY3 1 GRSA_BACBR 1 ACSA_SYNY3 1 GRSA_BACSU 1 ENTF_ECOLI 1 4CL2_SCLTU	P45/49 P39846 P36333 P40803 Q04747 P38137 P17814 Q55404 P14687 P14687 P1454 P31685	545	1293	2555	1098	653	563	543	3587	4447	669	2560	1278
DHBF-BACSU PPS2_BACSU ACSA_PENCH PKSK_BACSU SRE2_BACSU SRE2_BACSU FAT2_YEAST 4CL_ORYSA ACSA_SYNY3 GRSA_BACBR GRSA_BACBR GPS3_BACSU ENTE_ECOLI 4CL2_SOLTU	P45/49 P39846 P36333 P40803 Q04747 P38137 P17814 Q55404 P14687 P14687 P1454 P31685	Н	ب	Н	_	Н	۲	Н	_	۳	۳	_	۳
		4CL2_SOLTU	ENTF_ECOLI	PPS3_BACSU	GRSA_BACBR	ACSA_SYNY3	4CL_ORYSA	FAT2_YEAST	SRF2_BACSU	PKSK_BACSU	ACSA_PENCH	PPS2_BACSU	DHBF_BACSU

ALIGNMENTS

Qу	Qу	Qy	Qу	Qu Be: Ma	SQ SQ	ם מס	366	នួន	88	88	388	R R	77 77 77 77	RA	R R	RP R	R 0	88	DE DE	DI I		BU	RESULT
181 PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS 240 	121 LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGYVMSHQNVRVNFEQLMSGYFADTDGI 180 	61 RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120 	1 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60 	Query Match 94.0%; Score 1448; DB 1; Length 298; Best Local Similarity 98.3%; Pred. No. 2.5e-109; Matches 282; Conservative 2; Mismatches 3; Indels 0; Gaps 0;	INTERFOL: IFMOUDY 73; 7. PFAM; PF00501; AMP-binding; 1. Hypothetical protein; Transmembrane. SEQUENCE 298 AA; 32286 MW; 22232DD5DBC6F371 CRC64;	EMBL; M95808; AAA25367.1;	entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).	by non-profit institutions as long as its content is in no lified and this statement is not removed. Usage by and for commerc	between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its	This SWISS-PROT entry is copyright. It is produced through a collaboration	-!- SIMILARITY: STRONG, M.TUBERCULOSIS RV1521.	rium tuberculosis var. bovis Bacillus Calmette-Guerin.'	"Molecular cioning and sequencing of the gene for mycocerosic acid synthase, a novel fatty acid elongating multifunctional enzyme, from	Kolattukudy P.E.;	STRAIN=BCG; MEDLINE=92406887: PubMed=1527058:	SEQUENCE FROM N.A.	ebacterineae; My	Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;	A	01-JUN-1994 (Ref. 29, Last sequence update) 30-MAY-2000 (Rel. 39, Last annotation update)	(Rel. 29,	YMAZ_MYCBO STANDARD; PRT; 298 AA.	MYCBO

ρ

287

```
RESULT 3
YF21_MYCTU
SGEDDDG
                                                                                                                                          망
                                                                                                                                                            δÃ
                                                                                                                                                                                       밁
                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 2
MASC_MYCLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local :
       YF21_MYCTU STANDARD; PRT; 583 AA Q50586; 30-MAY-2000 (Rel. 39, Created) 30-MAY-2000 (Rel. 39, Last sequence update) 30-MAY-2000 (Rel. 39, Last annotation update) HYPOTHETICAL 63.1 KDA PROTEIN RV1521. FADD25 OR RV1521 OR MTCY19G5.07.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-OCT-1996
01-OCT-1996
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Smith D.R., Robison K.; Submitted (MAR-1994) to the EMBL/GenBank/DDBJ-i- SIMILARITY: TO M.TUBERCULOSIS RV1521.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MASC_MYCLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; U00010; AAA17075.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                INTERPRO; IPR000873;
                                                                                                                                          267
                                                                                                                                                                                       207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           242
                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                    87
                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                 27
                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
nes 179; Conserv
                                                                                                                                                                                                                                                                                                                                                         <u>س</u>
                                                                                                                                                                                                                                    DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                        AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQE
                                                                                                                                                                                     RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROTEIN
                                                                                                                                                                                                                                                                                    FIAVPLSVPQAGSHDERVGAVLADTSPSVVLTTSAVADAIAKYVDHSDTDTVPAILEVDS
                                                                                                                                                                                                                                                                                                                                 DYEQDWAGVRKTLTWAQLYQRTLNVAHELRRHGSIRDRAVILAPQGLDYIIAFLGAMQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                          PF00501; AMP-binding; 1. NCE 372 AA; 40745 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (Rel.
(Rel.
(Rel.
                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 34, Last sequence update)
39, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        34, Created)
                                                                                                                                                                                                                                                                                                                                                                                         60.5%;
                                                                                                                                                                                                                                                                                                                                                                                48;
                                                                                                                                                                                                                                                                                                                                                                                          Score 932;
Pred. No. 9.
                                                                                                                                                                                                                                                                                                                                                                                                                                          101FD12BB2BEC265 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 372
                                                                                                                                                                                                                                                                                                                                                                               ).4e-68;
les 69;
                                                                                                                                                                                                                                                                                                                                                                                                        DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           databases
                                                                                                                                                                                                                                                                                                                                                                                                      Length 372;
                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                           322
                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                 86
                                                                                                                                                                                                                                                                                                                                                                               0
```

```
RESULT 4
YT30_MYCTU
ID YT30_MYCTU
AC Q10976;
DT 01-OCT-1996 (
DT 01-OCT-1996 (
                                                                                                                                                                               Ş
                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                Dр
                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AX MEDINE=98295987; PubMed=9634230;
AC Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris D.,
AC Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F.,
AC Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F.,
AC Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd S.,
AC Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd S.,
AC Diver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J.,
AC AR Rutter S., Osborne J., Quail M.A., Rajandream M.A., Rogers J.,
AC Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston J.E.,
AC Taylor K., Whitehead S., Barrell B.G.;
AC "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence.";
AC "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence.";
AL Nature 393:537-544(1998).

AC "STANILARITY: TO ENZYMES WHICH ACT VIA AN ATP-DEPENDENT COVALENT BINDING OF AMP TO THEIR SUBSTRATE. STRONG, TO M.LEPRAE MASC AND BINDING OF AMP TO THEIR SUBSTRATE. STRONG, TO M.LEPRAE MASC AND STRONG OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TRANSMEM
TRANSMEM
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PFAM; PF00501; AMP-binding; 1.
PROSITE; PS00455; AMP_BINDING; FALSE_NEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hypothetical protein; Transmembrane.
TRANSMEM 77 97 POTENTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; Z77826; CAB01395.1; -. HSSP; P08659; 1LCI. TUBERCULIST; RV1521; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INTERPRO; IPR000873; -
                                                                                                                                                 269
                                                                                                                                                                                 239
                                                                                                                                                                                                                    209
                                                                                                                                                                                                                                                                                           149
                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                      29
                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               M.TUBERCULOSIS RV2930
                                                                                                                                               RIAVPLSVPQGGYTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                      KVAPPGSTVVSWLPFYHDMGFVLGLILPILAGIPAVLTSPIGFLQRPARWIQMLASNTLA
                                                                                                                                                                                                                                                                                         LDLDARPSSGSRSAAHGHPDILYLQYTSGSTRTPAGVMVSNKNLFANFEQIMTSYYGVYG
                                                                                                                                                                                                                                                                                                                              LDLDA--PNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTD
                                                                                                                                                                                                                                                                                                                                                                  IVAVPLSIPQGGAHDERTVSVFADTAPAIVLTASSVVDNVVEYVQPQPGQNAPAVIEVDR 148
                                                                                                                                                                                                                                                                                                                                                                                                                                      DYERSWDGVEETLTWSQLYRRTLNLAAQLREHGSTGDRALILAPQSLDYVVSFIASLQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   109
229
583 /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A,
                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               129 F
249 F
63141 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60.3%;
59.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 929; DB 1;
Pred. No. 2.9e-67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    POTENTIAL.
POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         POTENTIAL.
                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1FC1A9B661FDE427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                       626
                                                       ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                   327
                                                                                                                                                                                    297
                                                                                                                                                                                                                      268
                                                                                                                                                                                                                                                                                           208
                                                                                                                                                                                                                                                                                                                                                                                                                                      88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7
```

(Rel.

34, Created)
34, Last sequence

```
S K D D R R CCC
                                                                                                                                         Q
                                                                                                                                                                    В
                                                                                                                                                                                        Qy
                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PP PP B
                                                                RESULT 5
YD45_MYCTU
                                                                                                                     밁
  01-OCT-1996
01-OCT-1996
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-98295987; PubMed-9634230;

Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harri
Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F.,

Badcock K., Basham D., Brown D., Chillingworth T., Connor R.,

Badcock K., Basham D., Brown D., Chillingworth T., Connor R.,

Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyc

Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L.,

Oliver S., Osborne J., Ouail M.A., Rajandream M.A., Rogers J.,

Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston

Taylor K., Whitehead S., Barrell B.G.;

"Deciphering the biology of Mycobacterium tuberculosis from the
complete genome sequence.";

Nature 393:537-544(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboratio between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on it use by non-profit institutions as long as its content is in no was modified and this statement is not removed. Usage by and for commercial
                                       YD45_MYCTU
Q11015;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=H37RV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 30-MAY-2000 (Rel. 39, Last annotation update) HYPOTHETICAL 67.9 KDA PROTEIN RV2930.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Hypothetical
SEQUENCE 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO; IPR000873; -
PFAM; PF00501; AMP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TUBERCULIST; RV2930;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; Z74697; CAA98985.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis.
Bacteria; Firmicutes; Actinobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FADD26 OR RV2930 OR MTCY338.19.
                                                                                                                     310
                                                                                                                                            241
                                                                                                                                                                     252
                                                                                                                                                                                              181
                                                                                                                                                                                                                       192
                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                           132
                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity nes 172; Conserv
                                                                                                                                                                                                                                                                                                                              72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SIMILARITY: TO ENZYMES WHICH ACT VIA AN AT BINDING OF AMP TO THEIR SUBSTRATE. STRONG, M.TUBERCULOSIS RV1521.
                                                                                                                                                                                                                                                                                     RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                          DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                 AAPNFAFELAARRTTODDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNL
                                                                                                                                                                                   PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS
                                                                                                                                                                                                                                             LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI
                                                                                                                                                                                                                                                                         FIAVPLSTPQYGIHDDRVSAVLQDSKPVAILTTSSVVGDVTKYAASHDGQPAPVVVEVDL
                                                                                                                                                                                                                                                                                                                             DYGSDPKGFADSLTWSQVYSRACIIAEELKLCGLPGDRVAVLAPQGLEYVLAFLGALQAG
                                                                                                                                                                     --PTGTVVSWLPLYHDMGLILGICAPLVARRRAMLMSPMSFLRRPARWMQLLATSGRCFS
                                                                                                                                                                                                                       LDLDSPRQMPAFSRQHTGAAYLQYTSGSTRTPAGVIVSHTNVIANVTQSMYGYFGDPAKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                 626 AA;
  (Rel.
(Rel.
(Rel.
                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein
                                                     STANDARD;
  34, Created)34, Last sequence up39, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                 67935 MW;
                                                                                                                                                                                                                                                                                                                                                                                            56.4%;
                                                                                                                                                                                                                                                                                                                                                                                 40;
                                                                                                                                                                                                                                                                                                                                                                                            Score 869; DB 1;
Pred. No. 2.1e-62;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 F53F64F8C9171548 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
              update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacteriaceae; Mycobacterium
                                                     521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Actinobacteridae;
                                                     A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATP-DEPENDENT COVALENT
                                                                                                                                                                                                                                                                                                                                                                                 80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                                                                                                                                                                                                                                                                                                                                        Length 626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          M. LEPRAE
                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Holroyd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MASC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Harris
                                                                                                                                                                                                                                                                                                                                                                                2
                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                            240
                                                                                                                                                                                                                       251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .
.
                                                                                                                                                                                                                                                                                                                                                                                ۲.
RESULT 6
TYCC_BACBR
ID TYCC_BACBR
                                                                                                                 Дb
                                                                                                                                         Ωy
                                                                                                                                                                    В
                                                                                                                                                                                          Qy
                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                Qy
```

```
PROSITE: PSUU422,
Hypothetical protein;
Hypothetical protein;
Hypothetical protein;
Hypothetical protein;
Hypothetical protein;
Hypothetical protein;
TRANSMEM 206 226
F TRANSMEM 309 32
TRANSMEM 392 41
TRANSMEM 392 41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Cliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston Taylor K., Whitehead S., Barrell B.G.; "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence.";
Nature 393:537-544(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NUBERCULLS:, NUBER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=98295987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HYPOTHETICAL 53.9 KDA PROTEIN RV1345 FADD33 OR RV1345 OR MTCY02B10.09.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; 275555; CAA99978.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium tuberculosis
286
                                                                               280
                                                                                                                                                                       231
                                                                                                                                                                                                                                                                                                                                                        179
                                                                                                                                                                                                                                                                                                                                                                                                                                            165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     47 LEYVVAYLGALQAGRIAVPLSVPQGGVTDER-SDSVLSDSSPVAILTTSSAVDDVVQHVA 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIMILARITY: TO ENZYMES WHICH ACT VIA AN
DGLTRFAEAMAPF
                                                                     ATIKRFADRFARF
                                                                                                                                                                                                                                                           QRPARWMHLMASDFHAFSAAPNFAFELA---ARRTTDDDMAGRDLGNILTILSGSERVQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RRPGESPPSIIEVDLLDLDAPN-GYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRV 164
                                                                                                                                                                       ASPFRWLSWLSDSGATMTAAPNFAYNLIGKYARRVSE-----VDLGALRVTLNGGEPVDC
                                                                                                                                                                                                                                                                                                                                                   NLRGLNQRVGTDAATD-----VGCSWLPLYHDMGLAF-VLSAALAGAPLWLAPTTAFT
                                                                                                                                                                                                                                                                                                                                                                                                                              NFEQLMS--GYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFL 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RLRSVDTAGVTIGDLSTAAHTNRSATPVASEGP--AVLQGTAGSTGAPRTAILSPGAVLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VELVAAIQGAWLAGAAVSILPGPVRGANDQRWADATLTRFLGIGVRTVLSQ----GSYLA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the Swiss Institute of Bioinformatics and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             521 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PubMed=9634230;
R., Parkhill J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                88
226
329
412
501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 53957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            13.9%;
31.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 214; DB 1;
Pred. No. 6.8e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                POTENTIAL.
POTENTIAL.
POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POTENTIAL.
2D432512077122DB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATP-DEPENDENT COVALENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Harris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                       285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9;
```

```
This SWI
between
the Euro
        PROSITE; PSO0012; PHOSPHOPANTETHEINE; 6.
PROSITE; PS00455; AMP_BINDING; 6.
PROSITE; PS50075; ACP_DOMAIN; 6.
Ligase; Antibiotic biosynthesis; Phosphopantetheine;
Multifunctional enzyme; Repeat.
REPEAT 466 1038 DOMAIN 1 (ASPARAGINE-ACT
REPEAT 1521 2070 DOMAIN 2 (GLUTAMINE-ACT
REPEAT 2536 3113 DOMAIN 3 (TYROSINE-ACTI
                                                                                                                                                                                                                                                                                                                                                             PFAM;
PFAM;
PFAM;
PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15-JUL-1999 (Rel. 38, Created)
15-JUL-1999 (Rel. 38, Last sequence update)
15-JUL-1999 (Rel. 38, Last sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INTERPRO; INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nucleotide sequence and biochemical charact internal adenylation domains.";
J. Bacteriol. 179:6843-6850(1997).
-i- FUNCTION: INCORPORATES SIX AMINO ACIDS GLN, TYR, VAL, ORN, AND LEU) IN THEIR I
                                                                                                                                                                                                                                                                                                         PRINTS; PRO0154; AMPBINDING.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   use
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN-ATCC 8185;
MEDLINE-98012987; PubMed-9352938;
Mootz H.D., Marahiel M.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               modified and this statement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       030409;
15-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; AF004835; AAC45930.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "The tyrocidine biosynthesis operon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacillus/Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacillus brevis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACTIVASE)].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               by non-profit institutions as long
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MISCELLANÉOUS: TYROCIDINE IS A MIXTURE OF FOUR CYCLIC DECAPEPTIDES, TYROCIDINE A (D-PHE-PRO-PHE-D-PHE-ASN-GLN-TYR-VAL-ORN-LEU), B, C, AND D, IN WHICH PHE, AT POSITIONS 3, 4, AND TYR RESIDUES ARE GRADUALLY REPLACED BY TRP, DEPENDING ON THE RELATIVICONCENTRATIONS OF THESE AMINO ACIDS IN THE GROWTH MEDIUM.

SIMILARITY: TO OTHER ENZYMES WHICH ACT VIA AN ATP-DEPENDENT COVALENT BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SUBUNIT: LARGE MULTIENZYME COMPLEX OF TYCA, TYCB AND TYCC. DOMAIN: CONSISTS OF SIX MODULES, AND HARBORS A PUTATIVE THIOESTERASE DOMAIN AT 1TS C-TERMINAL END. EACH MODULE INCORPORATES ONE AMINO ACID INTO THE PEPTIDE PRODUCT AND CAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FURTHER SUBDIVIDED INTO DOMAINS RESPONSIBLE FOR SUBSTRATE ADENYLATION, THIOLATION, CONDENSATION (NOT FOR THE INITIATION MODULE), AND EPIMERIZATION (OPTIONAL), AND N METHYLATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PATHWAY: NON-RIBOSOMAL BIOSYNTHESIS OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PEPTIDE PRODUCT.

COFACTOR: CONTAINS 6 COVALENTLY BOUND PHOSPHOPANTETHEINES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ANTIBIOTIC TYROCIDINE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SWISS-PROT entry is copyright. It is produced through een the Swiss Institute of Bioinformatics and the Eleuropean Bioinformatics Institute. There are no resti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (OPTIONAL)
                                                                                                                                                                                                                                                                                                                                                                                     PF00501; AMP-binding; (PF00668; DUF4; 6. PF00975; Thioesterase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; IPR000255; -.; IPR000873; -.; IPR001031; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IPR001242;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Firmicutes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacillus/Clostridium gr
us group; Brevibacillus
                                                                                                                                                                                                                                                                                                                                                             <u>6</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   is not removed
                                                                                                                                                                                                                                                                                                                                                                                                 1.
DOMAIN 1 (ASPARAGINE-ACTIVATING).
DOMAIN 2 (GLUTAMINE-ACTIVATING).
DOMAIN 3 (TYROSINE-ACTIVATING).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of Bacillus brevis: characterization of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (See http://www.isb-sib.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S (FOR TYROCIDINE A, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CYCLIC PEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ON THE RELATIVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Complete
functional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a collaboration

MBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ASN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BΕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ņ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   way
```

```
JRSB_BACER

ID GRSB_BACER

AC p1468;

AC p1468;

DT 01-APR-1990 (Rel. 14, Created)

DT 01-APR-1993 (Rel. 25, Last sequence update)

DT 15-UUL-1999 (Rel. 38, Last annotation update)

DT 15-UUL-1999 (Rel. 38, Last annotation update)

DE GRANICIDIN S SYNTHETASE II [INCLUDES: ATP-DEPENDENT PROLINE ADENYLASE (VALA)

DE (PROA) (PROLINE ACTIVASE); ATP-DEPENDENT VALINE ADENYLASE (ORNA) (ORNITHINE

DE (PROA) (PROLINE ACTIVASE); ATP-DEPENDENT ORNITHINE ADENYLASE (ORNA) (ORNITHINE

ACTIVASE); ATP-DEPENDENT LEUCINE ADENYLASE (LEUA) (LEUCINE ACTIVASE)].
GRSB_GRSB_B
AC P14688
AC P14688
AC P15-JUL
DF GRAMIC
DE GRAMIC
DE (PRAMIC
DE (PRAMIC
DE GRAMIC
DE ACTIVA
GN GRSB O
OS Bactil
RN [1]
RN [1]
RN [1]
RP SEQUEN
RX MEDLIN
RX MEDLIN
RX MEDLIN
RX MEDLIN
RN [1]
RP SEQUEN
RX MEDLIN
RX 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BINDING
BINDING
BINDING
BINDING
BINDING
                                                                                                                                                          MEDLINE=92219998; PubMed=1560782;
Turgay K., Krause M., Marahiel M.A.;
"Four homologous domains in the primary structure
to domains in a superfamily of adenylate-forming
Mol. Microbiol. 6:529-546(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
REPEAT
REPEAT
DOMAIN
                                            MEDLINE=92041751; PubMed=1939016; Hori K., Yamamoto Y., Tokita K.,
                                                                                                                                                                                                                                              STRAIN=ATCC 9999;
MEDLINE=92219998;
                         Okamura K., Furuyama J.,
                                                                                           STRAIN-NAGANO;
                                                                                                                                                                                                                                                                                               SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5900 SLFQAILDCSTTT-----DFNQLRCVTLGGEKLPVQLVQKTKEK 5938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DOMAIN
                                                                                                                SEQUENCE OF 1-948
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12 TLTRSQLYRRTLNVAQELSRCGSTGDRVV-ISAPQGLEYVVAYLGALQAGRIAVPLSVPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
    nucleotide sequence for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASD--FHAFSAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PGYPQERIQYLLEDSNAALLLSQAHLLPLLAQVSSELP------ECLDLNAELDAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SLTYSELNERANRLARVLRAKGVGPDRLVAIMAERSPEMVIGILGILKAGGAYVPV---D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KAL-QVFSFAFD-GFVASLFAPLLGGATCVLPQEAA-AKDPVALKKLMAATEVTHYYGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LSGSNLPAVNQPTDLAYVIYTSGTTGKPKGVMIPHQGI-VNCLQ----WRRDEYGFGPSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLLDLDAPNGYT 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3590
4606
5658
970
2007
3045
4080
5124
6167
1000
2037
3075
6197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                  z
                                                                                                                                                                                                                                                                                                  Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4149
5203
6245
1037
2077
2112
3112
4147
5191
6234
1000
2037
3075
4110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -AYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGIPPPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12.4%; 27.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    724011
                                                                                                                z
                                                                                                                  Þ
                         Saito Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DOMAIN 4 (VALINE-ACTIVATING).
DOMAIN 5 (ORNITHLNE-ACTIVATING).
DOMAIN 6 (LEUCINE-ACTIVATING).
ACYL CARRIER (ACP).
PHOSPHOPANTETHEINE (BY SIMILARITY)
PHOSPHOPANTETHEINE (BY SIMILARITY)
PHOSPHOPANTETHEINE (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WW;
    a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 190.5; DB 1
Pred. No. 1.4e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PHOSPHOPANTETHEINE PHOSPHOPANTETHEINE PHOSPHOPANTETHEINE
  proline-activating domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4934900AF07DF786
                                              Saito
                                            ;
;
                                                                                                                                                                                    structure of GrsB are related
e-forming enzymes.";
                                              Kurotsu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E (BY SIMILARITY).
E (BY SIMILARITY).
E (BY SIMILARITY).
E (BY SIMILARITY).
E (BY SIMILARITY).
E (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CRC64;
                                              Τ.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            288
                                                 Kanda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   37;
                                                 Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5737
```

11;

```
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kurotsu T., Hori K., Kanda M., Saito Y.;
"Characterization and location of the L-proline activating from the multifunctional gramicidin S synthetase 2.";
J. Biochem. 109:763-759(1991).
-i- FUNCTION: THIS PROTEIN IS A MULTIFUNCTIONAL ENZYME, ABL
                         DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                           PFAM; PF00501; AMP-binding; 4. PFAM; PF000668; DUF4; 4. PFAM; PF00975; Thioesterase; 1 PFAM; PF00550; Pp-binding; 4. PRINTS; PR00154; AMPBINDING.
                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERPRO; INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                PROSITE; PS00455; PROSITE; PS50075;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             grsA and grsB
to fatty acid
                                                                  DOMAIN
                                                                                                                                                                                         Repeat;
                                                                                                                                                                                                                                                                         PROSITE; PS00012;
                                                                                                                                                                                                                                                                                                                                                                                                INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=92011463;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=NAGANO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-ATCC
                                                                                                                                                                                                               ligase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 1-15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kraetzschmar J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=90008776;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Gramicidin S biosynthesis operon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ramicidin S synthetase 2 gene
Biochem. 110:111-119(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IL; X61658; CAA43838.1; IL; W29703; AAA58719.1; -IL; X15577; CAA33604.1; -IL; D00938; BAA00778.1; -IL; S20542; YGBSG2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PATHWAY: NON-RIBOSOMAL BIOSYNTHESIS OF THE CYCLIC PEPTIDE ANTIBIOTIC GRAMICIDIN S (D-PHE-PRO-VAL-CAN-LEU)2.

SUBUNIT: LARGE MULTIENZYME COMPLEX OF GRSA AND GRSB
SUBUNIT: LARGE MULTIENZYME COMPLEX OF GRSA AND GRSB
DOMAIN: CONSISTS OF FOUR MODULES, AND HARBORS A PUTATIVE THIOESTERASE DOMAIN AT ITS C-TERMINAL END. EACH MODULE INCORPORATES ONE AMINO ACID INTO THE PEPTIDE PRODUCT AND CAN PUTATION CONDENSATION (NOT FOR THE INITIATION ADDRESS ON THE INITIATION CONDENSATION (NOT FOR THE INITIATION ADDRESS ON THE INITIATION CONDENSATION (NOT FOR THE INITIATION ADDRESS ON THE SUBSTRATE ADENTIATION (NOT FOR THE INITIATION CONDENSATION (NOT FOR THE INITIATION ADDRESS ON THE INITIATION ADDRESS ON THE INITIATION CONDENSATION (NOT FOR THE INITIATION ADDRESS ON THE INITIATION A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (OPTIONAL).
SIMILARITY: TO OT
COVALENT BINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACTIVATION SITES FOR THESE AA CONSIST OF INDIVIDUAL DOMAINS. COFACTOR: CONTAINS 4 COVALENTLY BOUND PHOSPHOPANTETHEINES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADENYLATION, THIOLATION, CONDENSATION (NOT FOR THE INITIAMODULE), AND EPIMERIZATION (OPTIONAL), AND N METHYLATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACTIVATE AND POLYMERIZE THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SWISS-PROT entry is copyright. It is produced through a centre Swiss Institute of Bioinformatics and the EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S20542; YGBSG2.
P14687; 1AMU.
                                                                                                                                                                                   Phosphopantetheine;
                                                                                                                                                                                                               Antibiotic
                                                                                                                                                                                                                                                                                                                                                                                              ; IPRO00255; -.; IPRO01031; -.; IPRO01031; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and this statement is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         non-profit institutions as long
                                         466
1521
2538
2538
3591
975
2011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       has an open reading thioesterases."; 171:5422-5429(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Krause M., Marahiel M.A.;
                                                                                                                                                                                                                                AMP_BINDING; 4
ACP_DOMAIN; 4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PubMed=2477357;
    1043
2080
3135
4173
1042
2078
3124
4162
                                                                                                                                                                                                                                                                         PHOSPHOPANTETHEINE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AND CHARACTERIZATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OTHER ENZYME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PubMed=1917901;
                                                                                                                                                                                                             biosynthesis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ENZYMES
DOMAIN 1 (PROLINE-ACTIVATING).
DOMAIN 2 (VALINE-ACTIVATING).
DOMAIN 3 (ORNITHINE-ACTIVATING).
DOMAIN 4 (LEUCINE-ACTIVATING).
ACYL CARRIER (ACP).
ACYL CARRIER (ACP).
ACYL CARRIER (ACP).
ACYL CARRIER (ACP).
                                                                                                                                                                                         Hydrolase.
                                                                                                                                                                                                                                                                                                                                      1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ES WHICH ACT VIA AN THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    from Bacillus brevis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AMINO ACIDS PRO,
                                                                                                                                                                                                             Multifunctional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              containing the frame encoding
                                                                                                                                                                                                                                                                           4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         There are no restrictions ong as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Usage
                                                                                                                                                                                                             enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              structural genes
a protein homologous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATP-DEPENDENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORN AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ABLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    collaboration
L outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LEU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        n no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
```

```
A CONTRACTOR OF THE PROPERTY O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BINDING
BINDING
BINDING
BINDING
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LONG-CHAIN-FATTY-ACID--COA LIGASE (EC SYNTHETASE).
[3]
SEQUENCE FROM N.A.
STRAIN=K12 / MG1655
                                                                                        J. Biol. Chem.
                                                                                                                    Black P.N., Dirusso C.C., Metzger A.K., Heimert T.L.; "Cloning, sequencing, and expression of the fadD gene coli encoding acyl coenzyme A synthetase.";
                                                                                                                                                                                                                                                                                                                                                                              Fulda M., Heinz E., Wolter F.P.;
"The fadD gene of Escherichia coli K12
39.6 min of the chromosomal map and is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Escherichia coli.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3867
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3668
                                                                                                                                                                                                                                              STRAIN-K12
                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=94150456; PubMed=8107670;
Fulda M., Heinz E., Wolter F.P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-FEB-1994
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-DEC-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3610 WEGQA--LIYHELNIKANQLARVLREKGVTPNHPVAIMTERSLEMIVGIFSILKAGGAYV 3657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                               MEDLINE=93094273;
                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                            AMP-binding protein family
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=K12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Escherichia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FADD OR OLDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LCFA_ECOLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6 WDGVAITLTRSQLYRRTLNVAQELSRCGSTGDR-VVISAPQGLEYVVAYLGALQAGRIAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             K 3867
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KLIASEEITHYYGVPSLFSAIL------DVSSSKDLQNLRCVTLGGEKLPAQIVKKIKE 3866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HLMASD--FHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PIDPAYPQ-----ERIQYLLEDSGAALLLTQS------HVLNK------LPVDIEW 3706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PL--SVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLLD 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LDLTDEQNYVEDGTNLPFMNQSTDLAYIIYTSGTTGKPKGVMIEHQSI-INCLQWRKEEY 3765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LDAPNGYTFKED-----EYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNF-----EQL 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                   FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FROM N.A.
                                                                                                                                                                                                                                                                                                                          Genet. 242:241-249(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1005
2041
3087
4125
274
418
654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                           acyl coenzyme A synthetase.
. 267:25513-25520(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AA;
                                                                                                                                                                                                               PubMed=1460045;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          24,
28,
37,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1005
2041
3087
4125
274
418
664
946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PGDTALQVFSFAFD-GFVASLFAPILAGATSVLPKEEE-AKDPVALK
                                                                                                                                                                                                                                                                   AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12.2%;
26.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             510036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Created)
                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PHOSPHOPANTETHEINE (PHOSPHOPANTETHEINE (PHOSPH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 187.5;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        H -> D (IN REF. 2).
K -> R (IN REF. 2).
NAVLTCVTKKF -> TCSFDVCYQEI (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HVRLHL ->
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                          윉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JHL -> QLPLTP (IN REF. 2
E0029C9B51F5A4B7 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           update)
6.2.1.3)
                                                                                                                                                                                                                                                                                                                                                                                     is located close a new member of t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .5e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (LONG-CHAIN ACYL-COA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (BY
(BY)
(BY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Y SIMILARITY).
Y SIMILARITY).
Y SIMILARITY).
                                                                                                                                                     of
                                                                                                                                                                                                                                                                                                                                                                                        e to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4451;
                                                                                                                                                     Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61;
                                                                                                                                                                                                                                                                                                                                                                                                                   rnd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14;
```

```
В
                                                  Ş
                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                               SQ SQ
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RA IIOh T., Alba H., Baba T., Fujita K., Hayashi K., Inada T.,
RA IIOh K., Kasai H., Kimura S., Kitakawa M., Kitagawa M.,
RA Alsono K., Kasai H., Kimura S., Kitakawa M., Kitagawa M.,
RA Makino K., Miki T., Mizobuchi K., Mori H., Mori T., Motomura K.,
RA Makade S., Nakamura Y., Nashimoto H., Nishio Y., Oshima T.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tagami H.,
RA Alto N., Sampei G., Seki Y., Sivasundaram S., Tag
                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 68; Conser
                                                                                                                                                                                                                                                                                                                                                                                               CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROSITE;
Ligase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL;
EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Blattner F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J., Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the El
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=97251358; PubMed=9097040;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=97426617; PubMed=9278503;
128
                                                        92
                                                                                                                 74
                                                                                                                                                                             36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BL; AE000275; AAC74875.1; -.
BL; D90823; BAA15600.1; -.
BL; D90824; BAA15609.1; -.
BL; D90825; BAA15614.1; -.
BL; D90825; BAA15614.1; -.
SP; P45062; A45062.
SP; P45062; A45062.
SP; D45062; A45062.
SP; D45062; BAA5062.
S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUBCELLULAR LOCATION: PARTIALLY MEMBRANE-ASSOCIATED (POTENTIAL).
SIMILARITY: TO OTHER ENZYMES WHICH ACT VIA AN ATP-DEPENDENT
COVALENT BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COFACTOR: REQUIRES MAGNESIUM. SUBUNIT: HOMODIMER (PROBABLE).
                                                                                                              VSNFAHTLEKVVDKTAVQHVILTRMGDQLSTAKGTVVNFVVKYIKRLVPKYHLPDAISFR
                                                        -----TTSSAVD-DVVQHV-ARRPGES------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    X70994; CAA50321.1; -.
L02649; AAA23752.1; -.
                                                                                                                                                                                                                                                                                                                                                                                      496
555
561
                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                               496
561
62332
                                                                                                                                                                                                                                                                        11.6%;
30.5%;
                                                                                                                                                                                                                                                                                                                                                                                                  ¥.
                                                                                                                                                                                                                                           26;
                                                                                                                                                                                                                                                                        Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                               A -> G (IN REF. 2).
GKVDNKA -> QSGQ (IN REF.
; 249B0AA54B3DBFA5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (IN REF. 2).
NEIEDVVMQHPGVQEVAAVGVPS
TRLKMSSCSMVAYRKSRLLAYLP
                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                        178.5;
No. 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             There are no rest
                                                                                                                                                                                                                                                                     ; DB 1 .3e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Usage
                                                                                                                                                                                                                                                                                                    1,
                                                        ----PPSIIEVDLLDLD 124
                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GALRRSTCVCEYGGGNDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (IN
                                                                                                                                                                                                                                                                                                                                                                                                                            2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REF.
                                                                                                                                                                                                                                           51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   s,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ror
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EXOGENOUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               outstation
                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       commercia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   way
                                                                                                                                                                                                                                           12;
```

```
Ş
                                                                                                                                                                                    В
                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                          δδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                        S
                                                                               밁
                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          **MEDITINE-9721700.**
Albertini A.M., Caramori T., Scottone r., Albertini A.M., Caramori T., Scottone r., Sequence around the 159 degree region of the Sequence around the 150 degree region of the Sequence regi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; U11039; AAA85143.1; -. EMBL; Z99112; CAB13589.1; -. EMBL; Z99113; CAB13600.1; -. EMBL; E99113; EG10929; PKSJ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a c
between the Swiss Institute of Bioinformatics and the EMBL
the European Bioinformatics Institute. There are no restrict
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A. SEQUENCE FROM PB1424;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacillus subtilis.
Bacteria; Firmicutes; Bacillus/Clostridium group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01-FEB-1995
01-NOV-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P40806;
01-FEB-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRINTS; PRO0154; AMPBINDING.
PROSTTE; PS00455; AMP_BINDING; 1.
Antibiotic biosynthesis; Ligase.
SEQUENCE 557 AA; 62063 MW; E1'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTERPRO; IPR000873; -.
PFAM; PF00501; AMP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PKSJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PUTATIVE POLYKETIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -1- SIMILARITY: TO OTHER ENZYMES WHICH ACT VIA AN ATP-DEPENDENT COVALENT BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=95219083; PubMed=7704258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacillus/Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PKSJ_BACSU
                                                                               174
                                                                                                                                122
                                                                                                                                                                                    114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                125
                                                                                                                                                                                                                                        66
                                                                                                                                                                                                                                                                                            54
                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity
                                                                                                                                                                                                                                                                                                                                                7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SECONDARY METABOLISM.
                           IPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWM----
                                                                            SAEADTDWHQSSPE--DLALLLLTSGSTGTPKAVMLNHRNIMSMVKGIIQMQGFTRE---
                                                                                                                             DLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQL--MSGYFADTDG
                                                                                                                                                                                                                                        LSVPQGGVTDERSDSVLSDS----SPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLL
                                                                                                                                                                                                                                                                                            DGTEVYQSYRRLWDDGLRIAKGLRQSGLKAKQSWILQLGDNSQLLPAFWGCVLTGVVPAP
                                                                                                                                                                                                                                                                                                                                             DGVAITLTRSQLYRRTLNVAQELSRCGSTGDRV-VISAPQGLEYVVAYLGALQAGRTAVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPLLHPGKELVVTALPLYHIFALTINCLLFIELGGQNLLITNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           G--IPPPNSALVSWLPFYHDMGLVIGICAPI-LGGYPAVLTSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AP--NGYTF---KEDEYP-STAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTD
                                                                                                                                                                                    LAVPPTYAESSSGTQKLKDAWTLLDKPAVITDRGMHQEMLDWAKEQGLEGFRAIIVEDLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SALHNGYRMQYVKPELVPEDLAFLQYTGGTTGVAKGAMLTHRNMLANLEQVNATY----
                                                                                                                                                                                                                                                                                                                                                                                                    67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IPR000873;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel. 31, Created)
(Rel. 31, Last sequence update)
(Rel. 32, Last annotation update)
LYKETIDE BIOSYNTHESIS PROTEIN PKSJ
                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                            11.5%;
22.9%;
<del>..</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                            Score 176.5;
Pred. No. 7.7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Scoffone F., Scotti C., Giree region of the Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E173B32386B540E4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                There are no restrictions on
                                                                                                                                                                                                                                                                                                                                                                                                                       .7e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                                                                                                                                                                                                                                                                                           DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERMEDIATE WHICH MAY BE
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Galizzi A.;
us subtilis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STEPS FOR
                                                                                                                                                                                                                                                                                                                                                                                            25
                              -HLMASD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               collaboration
L outstation -
                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ħ
                                                                                                                     179
                                                                                                                                                                                                                                           121
                                                                                                                                                                                         173
                                                                                                                                                                                                                                                                                               113
                                                                                                                                                                                                                                                                                                                                                   65
                              235
                                                                                                                                                                                                                                                                                                                                                                                                       7;
```

```
RESULT
Y934_HU
1D 730
AC 930
A
                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                 ρ
                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                               δÃ
                                                                                                       В
                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9Y2E4;
30-MAY-2000
30-MAY-2000
30-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entrepean Bioinformatics Institute. There are no restructe by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nagase T., Ishikawa K.-I., Suyama M., Kikuno R., Hirosawa M., Miyajima N., Tanaka A., Kotani H., Nomura N., Ohara O.; Miyajima N., Tanaka A., Kotani H., Nomura N., Ohara O.; "Prediction of the coding sequences of unidentified human genes. XII "Prediction of the coding sequences of 100 new cDNA clones from brain which code for large proteins in vitro."; DNA Res. 6:63-70(1999).
1073
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TISSUE-BRAIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mammalia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Eukaryota; Metazoa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HYPOTHETICAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; AB023151; BAA76778.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hypothetical protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=99246063; PubMed=10231032;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Y934_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Homo sapiens (Human)
                                                                                                                                                                                                              968
                                                                                                                                                                                                                                                                173
                                                                                                                                                                                                                                                                                                                     912
                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                            852
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SIMILARITY: STRONG,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IANSLTCVQLHKRAEKIAVMLMERGHLQDGDHVALVYPPGIDLIAAFYGCLYAG--CVPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KRFADRFARFNLQER
                                                                                                                                                                                                                                                                                                                  DLPKKRP-AQICKPCNPDTLAYLDFSVSTTGMLAGVKMSHAATSAFCRSIKLQCELY---
                                                                                                                                                                                                                                                                                                                                                                    LLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSH-----QNVRVNFEQLMSG
                                                                                                                                                                                                                                                                                                                                                                                                                            TVRPPHPQNIATTLPTVKMIVEVSRSACLMTTQLICKLLRSREAAAAVDVRTWPLILDTD
                                                                                                                                                      --HLMASDFHAFSAAPNFAFELAAR----RTTDDDMAGRDLGNILT-ILSGSERVQAATI
                                                                                                                                                                                                                                                             YFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWM---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SV----PQGGVTDERSDSVLSDSSPVAILTTSSAVDDVV---QHVARRPGESPPSIIEVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFAD 287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----DITFNWMPFDHVGGIGMLHLRDVYLGCQEINVSSETILMEPLKWLDWIDHYRAS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                s requires a license agreement (
an email to license@isb-sib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -VTWAPNFAFGLVTDFAEEIKDKKWDLSSMRYMLNGGEAMVAKVGRRILE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eutheria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1352 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                        PSREVAICLDPYCGLGFVLWCLCSVYSGHQSILIPPSELETNPALWLLAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                39, Created)39, Last sequence up39, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chordata;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11.1%; 23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                148575 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KIAA0934 (FRAGMENT).
                                                                                                       -VMELCTKGLGSQTESLKARGLDLSRVRTCVVVAEERPRIALT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TO KIAA0184.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 170.5;
Pred. No. 7.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Catarrhini;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Craniata; Vertebrata; Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6625B91B3A0A2BC6 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ), DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Hominidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1352;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     XIII.
                                                                                                                                                                                                           1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        66
                                                                                                                                                                                                                                                                                                                                                                                                                         911
                                                                                                                                                                                                                                                             229
                                                                                                                                                                                                                                                                                                                  967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          on
```

```
TUCL_PHOPY

ID LUCI_PHOPY

AC P08659

DT 01-AN

ENA

RA CELL

RA FIRAL

RA 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P08659;
01-JAN-1988
01-JAN-1988
15-DEC-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Biophys. J. 75:2205-2211(1998).

I FUNCTION: PRODUCES GREEN I.GHT WITH A WAVELENGTH OF 562 NM.

CATALYTIC ACTIVITY. LUCIFERIN + O(2) + ATP = OXIDIZED LUCIFER CO(2) + H(2)O + AMP + PYROPHOSPHATE + LIGHT.

CO(2) + H(2)O + AMP + PYROPHOSPHATE + LIGHT.

SUBCELLULAR LOCATION: PEROXISOMAL.

SUBCELLULAR LOCATION: PEROXISOMAL.

SIMILARITY: TO OTHER ENZYMES WHICH ACT VIA AN ATP-DEPENDENT COVALENT BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  X-RAY CRYSTALLOGRAPHY (2.2 ANGSTROMS).
MEDLINE=99007339; PubMed=9788915;
Franks N.- Jenkins A., Contl E., Lieb
"Structural basis for the inhibition of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conti E., Franks N.P., Brick P.; "Crystal structure of firefly luciferase throws superfamily of adenylate-forming enzymes."; structure 4:287-298(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-JAN-1988 (Rel. 06, Created)
01-JAN-1988 (Rel. 06, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation update)
LUCIFERIN 4-MONOOXYGENASE (EC 1.13.12.7) (LUC
Photinus pyralis (North American firefly).
                            Oxidoreductase; Monooxygenase; Photoprotein; Peroxisome; 3D-structure.

SITE 548 550 MICROBODY TARGET SERITERATE FOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Keller G.-A., Gould S., de Luca M., Subramani S.; "Firefly luciferase is targeted to peroxisomes in Proc. Natl. Acad. Sci. U.S.A. 84:3264-3268(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBCELLULAR LOCATION. MEDLINE=87204117; Pub
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=87144243; PubMed=3821727; de Wet J.R., Wood K.V., Deluca M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Pterygota; Neoptera; Endopterygota; Coleoptera; Poly
              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   between the Swiss Institute of Bioinformatics the European Bioinformatics Institute. There a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     general anesthetic.",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=96398615; PubMed=8805533;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                X-RAY CRYSTALLOGRAPHY (2.0 ANGSTROMS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Firefly luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TUCI_PHOPY
                                                                                                                                                                                                                                                         INTERPRO;
                                                                                                                                                                                                                                                                              BL; M15077; AAA29795.1;
BL; X84848; CAA59283.1;
BL; U03687; AAA03551.1;
BL; U89934; AAB64396.1;
BL; U89935; AAB64399.1;
BL; U89935; AB64399.1;
BL; U89936; AB64399.1;
BL; U89956; A
                                                                                                                                                                                                                         PF00501; AMP-binding;
                                                                                                                                                 PS00342; MICROBODIES_CTER; PS00455; AMP_BINDING; 1.
                                                                                                                                                                                                                                                         IPR000873;
548
550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Biol.
              AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cantharoidea; Lampyridae; Photinus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7:725-737(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PubMed=3554235;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene: structure
              60745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Endopterygota; Coleoptera;
                                                                                                                                                                                                                                                                                                                                                                                            . . . . . .
                 Œ,
                                                 MICROBODY TARGETING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                 E380FCE9D56ACCDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Helinski D.R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         W.R., Brick P.;
firefly luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         There are no restrictions of as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               expression
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (LUCIFERASE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AΑ
                                                                                                                     Luminescence;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                in mammalian
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Polyphaga;
                 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             light
                                                 SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NGTH OF 562 NM.
OXIDIZED LUCIFERIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Subramani
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mammalian
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γď
                                                                                                                 Magnesium;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  s.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cells.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   in no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 12
LCFA_BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뫄
Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 74
                                                                                                                          the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                  MEDLINE=97124191; PubMed=8969504; Wipat A., Carter N., Brignell C.S., Guy J.B., Piper K., Sainders J., Emmerson P.T., Harwood C.R.; Brignell C.S. region of the Bacillus subtilis chromosome containing genes responsible for stress responses, the utilization of plant cell walls and primary
                                                                                            entities requires
or send an email t
                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                     Microbiology 142:3067-3078(1996).
-I- CATALYTIC ACTIVITY: ATP + A LONG-CHAIN CARBOXYLIC ACID + PYROPHOSPHATE + AN ACYL-COA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-NOV-1997
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacillus subtilis.
Bacteria; Firmicutes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation updat.
LONG-CHAIN-FATTY-ACID--COA LIGASE (EC 6.2.1
   INTERPRO
                                                                                                                                                                                                                                                                                                                     metabolism.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacillus/Staphylococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SYNTHETASE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LCFA_BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                     COFACTOR: REQUIRES MAGNESIUM (BY SIMILARITY).
SIMILARITY: TO OTHER ENZYMES WHICH ACT VIA AN ATP-DEPENDENT
COVALENT BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ---SERVQAATIKRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APLSKEVGEAVAKRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APANDIYNERELLNSMNISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACVRFSHARDPIFGNQ---IIPDTAILSVVPFHHGFGMFTTLGYLIC-----GFRVVL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IEVNITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV---
                                 P08659;
                                              Z75208; CAA99571.1;
Z99118; CAB14816.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          74;
                                                                                          s requires a license agreement (S an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGG
                BG11946;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                LCFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       11.0%;
23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacillus/Clostridium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 170; DB 1;
Pred. No. 2.5e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          update)
: 6.2.1.3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          560
                                                                                                           (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           group
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           119;
                                                                                                                           Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (LONG-CHAIN ACYL-COA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                           bу
                                                                                                                             and
                                                                                                                           tor
                                                                                                                                                                                                                                                                                       COA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                             commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                       AMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17;
```

```
JACA_BACLI

ID BACA_BACLI

AC 068006;

DT 15-JUL-1999 (Rel. 38, Careated)

DT 15-JUL-1999 (Rel. 38, Last sequence update)

DT 15-JUL-1999 (Rel. 38, Last sequence update)

DT 15-JUL-1999 (Rel. 38, Last sequence update)

DT 15-JUL-1999 (Rel. 38, Last annotation update)

DE BACTIRACIN SYNTHETASE 1 (BA1) (INCLUDES: ATP-DEPENDENT ISOLEUCINE

DE ADENYLASE (ILEA) (ISOLEUCINE ACTIVASE); ATP-DEPENDENT LEUCINE ADENYLASE

(LEUA) (LEUCINE ACTIVASE); ATP-DEPENDENT LEUCINE ADENYLASE

(LEUA) (LEUCINE ACTIVASE); ATP-DEPENDENT GLUTAMATE ADENYLASE (GLUA)

(GLUTAMATE ACTIVASE); ATP-DEPENDENT ISOLEUCINE ADENYLASE (GLUA)

(GLUTAMATE ACTIVASE); GLUTAMATE RACEMASE (EC 5.1.1.3)].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
             RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SQ DR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PFAM, PF00501; AMP-binding; 1.
PROSITE; PS00455; AMP_BINDING;
Ligase; Fatty acid metabolism;
SEQUENCE 560 AA; 62691 MW;
                                                                                                                                                                                                                   synthetases.";
                                                                                                                                                                                                                                   Konz D., Klens A., Schoergendorfer K., Marahiel M.A.;
"The bacitracin biosynthesis operon of Bacillus licheniformis
10716: molecular characterization of three multi-modular pepti
                                                                                                                                                                                                                                                                                MEDLINE=98089193; PubMed=9427658;
                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                       -!- PATHWAY: NON-RIBOSOMAL BIOSYNTHESIS ANTIBIOTIC BACITRACIN.
                                                                                                                                                       -!- COFACTOR: CONTAINS
                                                                                                                                                                                                       Chem.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7
THE FOURTH MODULE. EACH MODULES AND ONE EPIMERIZATION DOMAIN THE PEPTIDE PRODUCT AND CAN BE FURTHER SUBDIVIDED INTO DOMAINS RESPONSIBLE FOR SUBSTRATE ADENYLATION, THIOLATION, CONDENSATION (NOT FOR THE INITIATION MODULE), AND FETUMERY.
                                                                                                                                                      FUNCTION: ACTIVATES FIVE AMINO ACIDS, INCORPORATES ACIDS, RELEASES AND CYCLIZES THE MATURE BACITRACIN. COFACTOR: CONTAINS 5 COVALENTLY BOUND PHOSPHOPANTET
                                                                                                                                         (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DGVAIT----LTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RIAV---PLSVPQGGVTDERSDSVLSDSSPVAILT------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HYDLSSIKSCLSGSAALPVEVKQKF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GRDLGNILTILSGSERVQAATIKRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAPILGGYPAVLTSPVSFLQRPARWMHLMASDFH---AFSAAPNFAFELAARRTTDDDMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YTGGTTGAPKGVMLTHQNILANTEMCAAMMYDVKEGA----EKVLGIVPFFHVYGLTAVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GIVVQTNPL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DKTAISFYGKKLTFHDILTDALKLAAFLQCNGLQKGDRVAVMLPNCPQTVISYYGVLFAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NYSIKLGFEMILLPKFDPLET----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KDYLPFPKNILYPLTQKQKVHIDFDKTANIHTFASCMKQEKTELLTIPKIDPEHDIAVLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RRPGESPPSII-----EVDLLDLD-APNGYTF-----
                                                                                                                                                                                                      Biol. 4:927-937(1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --YTEHELEYQLRDAQVSVIITLDLLFPKAIKMKTLSIVDQILITSV 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -- LKIIDKHKPTLFPGAPTIYIGLLHH----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Magnesium.
416A664E5926C7EA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3; DB 1;
3.7e-06;
                                                                                                                          OF.
                                                                                                                                                         PHOSPHOPANTETHEINES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           135;
                                                                                                                          CYCLIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -TSSAVDDVVQHVA 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -KEDEYPSTAYLQ
                                                                                                                                                                                       OWI
             (OPTIONAL), AND
                               CONDENSATION
                                                                                                                                                                                                                                     peptide
                                                                                                                                                                                       D-AMINO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           66.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PELQ
                                                                                                                                                                                                                                                    ATCC
                                                              INTO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12;
```

```
Ω
                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                Qy
                                               Qy
                                                                                                             В
                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BINDING
BINDING
BINDING
BINDING
BINDING
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              modified and this statement is not removed.
entities requires a license agreement (See
or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PFAM; PF00501; AMP-binding; PFAM; PF00668; DUF4; 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the European Bioinformatics Institute. The symmetry of the sym
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ÷
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROSITE; PS50075; ACP_DOMAIN; 5.
Ligase; Isomerase; Antibiotic biosynthesis; Phosphopantetheine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROSITE; PS00012; PHOSPHOPANTE PROSITE; PS00455; AMP_BINDING;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRINTS; PR00154;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PFAM; PF00550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AF007865; AAC06346.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REPEAT
206
                                                        169
                                                                                                                157
                                                                                                                                                                         115
                                                                                                                                                                                                                                 112
                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                               52
                                                                                                                                                                                                                                                                                                                                                                                                       7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PHE-9, AND ASP-11).
SIMILARITY: TO OTHER ENZYMES WHICH ACT VIA AN ATP-DEPENDENT COVALENT BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DODECAPEPTIDES, THAT DIFFER BY ONE OR TWO AMINO ACIDS. THE MOST ABUNDANT IS BACITRACIN A, A BRANCHED CYCLIC DODECAPETIDE. IT CONTAINS AN N-TERMINAL LINEAR PENTAPEPTIDE MOIETY (ILE-CYS-LEU-D-GLU-ILE) WITH AN ISOLEUCINE-CYSTEINE THIAZOLINE CONDENSATION PRODUCT AND A C-TERMINAL HEPTAPEPTIDE RIMG (LYS-D-ORN-ILE-D-PHE-HIS-D-ASP-ASN), IN WHICH THE FREE ALPHA-CARBOXY GROUP OF THE C-TERMINAL ASN IS BOUND TO THE EPSILON-AMINO GROUP OF LYSINE. IT CONTAINS FOUR AMINO ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION (GLU-4, ORN-7, DREED AND ASCILLATION ACIDS IN THE D-CONFIGURATION ACIDS IN THE D-CONFIGUR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N METHYLATION (OPTIONAL).

MISCELLANEOUS: BACITRACIN IS A MIXTURE OF AT LEAST TEN
DODECAPEPTIDES, THAT DIFFER BY ONE OR TWO AMINO ACIDS.
                                                                                                                                                                                                                                                            RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVD-----DVVQHVARRPGESPPS
:|: |: |: |: || :||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SWISS-PROT entry is copyright. It is produced through
een the Swiss Institute of Bioinformatics and the EN
                                                                                                                                                                                                                           GAYLPID-PE--TPKDRIAFMLSDTKAAVLLTQGKAADGIDCEADIVQ--
                                                                                                                                                                                                                                                                                                                                            DHTALVFGAQRMTYRELNEKANQTARLLREKGIGRGSIAAIIADRSFEMIIGIIGILKAG
                                                                                                                                                                                                                                                                                                                                                                                                 DGVAITLTRSQLYRRTLN----VAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAG
                                                     LMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARW
                                                                                                                                                                IIEVDLLDLDAPNGYTFKE-----DEYPSTAYLQYTSGSTRTPAGVVMSHQNV-RVNFEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
- VQNTNYIDITEDNVILQLSNYSFDGSVFDIFGALLNGASLVMIEKEALLN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IPR001242; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IPR000255; -. IPR000873; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3664
5171
574
1615
2651
3694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1109
2124
3164
4668
621
544
1585
2621
                                                                                                                LDREASDGFS-KEPLSSVNDSGDTAYIIYTSGSTGTPKGVITPHYSVIRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               pp-binding; 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ą,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AMPBINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PHOSPHOPANTETHEINE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        598254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Repeat.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOMAIN 3 (LEUCINE-ACTIVATING).
DOMAIN 4 (GLUTAMINE-ACTIVATING).
DOMAIN 5 (ISOLEUCINE-ACTIVATING).
CYCLIZATION (POTENTIAL).
ACYL CARRIER (ACP).
ACYL CARRIER (ACP).
ACYL CARRIER (ACP).
ACYL CARRIER (ACP).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PHOSPHOPANTETHEINE (B)
PHOSPHOPANTETHEINE (B)
PHOSPHOPANTETHEINE (B)
MW; 905E8DD68450F85B (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PHOSPHOPANTETHEINE PHOSPHOPANTETHEINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       162;
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (ISOLEUCINE-ACTIVATING).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0.00021;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                            124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          E (BY SIMILARITY).
E (BY SIMILARITY).
E (BY SIMILARITY).
E (BY SIMILARITY).
E (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 5255;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                            64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CYCLIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   commercia.
                                                                                                                                                                   168
                                                                                                                                                                                                                                                                                                                                            111
                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                     228
                                                                                                             205
                                                                                                                                                                                                                           156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            on
                                                                                                                                                                                                                                                                                                                                                                                                                                                            13;
```

Š

QELSRCGST - - -

В

27 81

EESNRAGNVLRRYGNVEKGDRVFIFMPRSPELYFIMLGAIKIGAIAGPLFEAFMEGAVKD 140

-GDRVVISAPQGLEYVVAYLGALQAGRIAVPL--SVPQGGVTD 75

```
RESULT 14

ACSA_BACSU
ID ACSA, E
AC P39062
DT 01-FEE
DT 01-FEE
DT 15-DEC
DE ACETYI
DE ACTIVA
GN BACILI
OC BACTEI
OC THIS
OC OI SEOUE
OC OI SE
OC CO SE
OC CO SE
OC CO SE
OC CO SE
OC S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
Query Match
Best Local S
Matches 80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=98048467; PubMed=9387221;
Lapidus A., Galleron N., Sorokin A., Ehrlich S.D.
"Sequencing and functional annotation of the Bac
in the 200 kb rrnB-dnaB region.";
Microbiology 143:3431-3441(1997).
-i- EUNCTION: ROLE IN GROWTH AND SPORULATION ON
-i- EUNCTION: TOLE IN GROWTH AND SPORULATION ON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Identification of genes involved in acetoin in Bacillus subtilis."; Mol. Microbiol. 10:259-271(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacillus subtilis.
Bacillus/Clostridium group;
Bacteria; Firmicutes; Bacillus/Clostridium group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                use by non-profit institutions as long as its content modified and this statement is not removed. Usage by a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-FEB-1995 (Rel. 31, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation update)
ACETYL-COENZYME A SYNTHETASE (EC 6.2.1.1) (ACETATE--COA LIGASE) (ACYI.-ACTIVATING ENZYME) (ACETYL-COA SYNTHASE).
                                                                                                                                                                            PROSITE;
                                                                                                                                                                                                                             SUBTILIST; BG10370; INTERPRO; IPR000873;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=95020526; PubMed=7934817; Grundy F.J., Waters D.A., Takova T.Y., Henkin
                                                                                                                                                                                                                                                                                                                                                                                                                              or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                           entities requires a license agreement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P39062
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACSA_BACSU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             310 VLNHVGRDKL 319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIMILARITY: TO OTHER ENZYMES WHICH ACT VIA COVALENT BINDING OF AMP TO THEIR SUBSTRATE.
                                                                                                                                                                                                                                                                               ;; AF008220; AAC00302.1; -.; Z99119; CAB14946.1; -. S39646; S39646.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACETYL-COA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SWISS-PROT entry is copyright. It is produ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MHLMASDFHAFSAAPNF----AFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKR
                                                                                                          TE; PS00455; AMP_BINDING; 1.
FS; Sporulation.
TE 572 AA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INRLGSAINEEKVSVMFITTALFNMIA-----DIHVDCLSNLRKILFGGERASIPHVRK
                                                                                                                                                                                                                                                                                                                                                                               L17309; AAA68287.1; -.
                                                                                                                                                                                                        PF00501;
  Similarity 26.8 80; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31, Created)
                                                                                                                                                                                                                                                     ACSA.
                          10
                          . 5 %
  Score 161.5; DB 1;
Pred. No. 1.3e-05;
1; Mismatches 100;
                                                                                                                               2E16BB907A253F97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   It is produced through a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           utilization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  572 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                      (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S.D.;
Bacillus subtilis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  T.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ΑN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACETATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           of acetate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATP-DEPENDENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                +
                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PYROPHOSPHATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  restrictions on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   is
for
     77;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genes
  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          no
     17;
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ULTMAY-1992 (Rel. 22, Created)
01-MAY-1992 (Rel. 22, Last sequence update)
15-JUL-1998 (Rel. 36, Last annotation update)
DELTA-(L-ALPHA-AMINOADIPYL)-L-CYSTEINYL-D-VALINE
(EC 6.-.-) (ACV SYNTHETASE) (ACVS)
PCRAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gutierrez S., Diez B., Montenegro E., Martin J.F.;
"Characterization of the Cephalosporium acremonium pcbAB gene
encoding alpha-aminoadipyl-cysteinyl-valine synthetase, a large
multidomain peptide synthetase: linkage to the pcbC gene as a clust
of early cephalosporin biosynthetic genes and evidence of multiple
              PRINTS; PRO0154; AMPBINDING; PROSITE; PS00012; PHOSPHOPANTETHEINE; PROSITE; PS00455; AMP_BINDING; 3. PROSITE; PS50075; ACP_DOMAIN; 3.
                                                                                                                                                                                   PIR; A38531; YGCEVC.
HSSP; P14687; 1AMU.
INTERPRO; IPR000255;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       _CEPAC
                                                                                                                                                   INTERPRO; IPRO00255; -.
INTERPRO; IPRO00873; -.
INTERPRO; IPRO01031; -.
                                                                                                                                                                                                                                                                                                                                                                                       Cephalosporium acremonium.";
Curr. Genet. 18:523-530(1990)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PARTIAL SEQUENCE
STRAIN-ATCC 11550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A. MEDLINE-91177827; PubMed-1706706;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cephalosporium acremonium (Acremonium chrysogenum).
Eukaryota; Fungi; Ascomycota; anamorphic Ascomycota; Acremonium.
Ligase;
                                                                                                                                       INTERPRO;
                                                                                                                                                                                                                                                                                                          -
                                                                                                                                                                                                                                                                                                                                                                                                              "Gene disruption of the pcbAB gene encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                  Hoskins J.A., O'Callaghan N., Queener S.W., Chen V.J., Skatrud P.L.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-91168300; PubMed=2076552;

 J. Bacteriol.

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            functional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PCBAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACVS_CEPAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  76
                                                                                                                                                                                                                                                              PATHWAY: FIRST STEP CEPHALOSPORIN.
                                                                                                                                                                                                                                                                                                          INTERMEDIATES.

COFACTOR: CONTAINS 3 COVALENTLY BOUND PHOSPHOPANTETHEINES
                                                                                                                                                                                                                                                                                                                                    FUNCTION: EACH OF THE CONSTITUENT AMINO ACIDS OF THE TRIPEPTIDE ACV ARE ACTIVATED AS AMINOACYL-ADENYLATES WITH PEPTIDE BONDS FORMED THROUGH THE PARTICIPATION OF AMINO ACID THIOLESTER
                                                                                                                                                                                                                                 COVALENT BINDING
                                                                                                                                                                                                                                                 SIMILARITY: TO OTHER
                                                                                                                                                                                                                                                                                            (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WYGTIEQLGVNVWYSAPT-AFRML--MGAGDEMAAKYDLTSLRHVLSVGEPLNPEVIR 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WMHLMAS-DFHAFSAAPNFAFELAARRTTDDDMAGR-DLGNILTILSGSERVQAATIK 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEEDIYWCTAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TRLDIE----WMDKKDGF----LLHYTSGSTGTPKGVLHVHEAM---IQQYQTGKWVLDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -LLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSG------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----YFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ERSDSVLSDSSPVAILTTSSAVDDV - - - - - - VQHVARRPG - - ESPPSIIEVD - - - - - -
                                                                                                                    PF00501; AMP-binding;
                                                                            PF00550;
                                                                                         PF00668; DUF4; 3. PF00975; Thioesterase;
 Antibiotic
                                                                                                                                    IPR001242;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -LENSEAKVVVTTPELLERIPVDKLPHLQHVFVVGGEAESGTNIINYDEAAKQES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            domains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            173:2354-2365(1991).
                                                         pp-binding; 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FROM N.A., AND PARTIAL SEQUENCE
 biosynthesis;
                                                                                                                                                                                                                                 OF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----PGWV-----TGTVYGIFAPWLNGATNVI----VGGRFSPES
                                                                                                                                                                                                                                 AMP
                                                                                                                                                                                                                                                                            IN THE BIOSYNTHESIS
                                                                                                                                                                                                                                               ENZYMES WHICH ACT VIA AN
                                                                                                                       ω.
                                                                                                                                                                                                                               TO THEIR SUBSTRATE
 Multifunctional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3712 AA
                                              2
                                                                                                                                                                                                                                                                              OF.
                                                                                                                                                                                                                                                                                                                                                                                                                    ACV synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cantwell C.A.,
                                                                                                                                                                                                                                                                            PENICILLIN AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SYNTHETASE
enzyme;
                                                                                                                                                                                                                                               ATP-DEPENDENT
                                                                                                                                                                                                                                                                                                                                                                                                                       in
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Wood J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cluster
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ġ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  119
```

```
οy
                                                                                                                                                                   Q
                                                                                                                                                                                                                     Q
                       Q
                                                Вþ
                                                                      Ş
                                                                                               В
                                                                                                                                                Ъ
                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                               D
                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                            SPT FFFFFFFFW W
                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                          REPEAT
REPEAT
DOMAIN
DOMAIN
DOMAIN
BINDING
BINDING
BINDING
BINDING
BINDING
BINDING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Repeat;
REPEAT
                                               2669
                                                                                                                                                2555
                                                                                                                                                                                               2510
2719 FA
                                                                                                2615
                                                                                                                                                                                                                                          2450 DRIAIADGTRSLSYSELNERANQLYHLIISSASIVADDRIALLLDKSIDMVIALLAVWKA 2509
                                                                                                                       169
                                                                                                                                                                       120
                        289
                                                                        229
                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                     7 DGVAI-----TLTRSQLYRRTLNVAQELSRCGS--TGDRVVISAPQGLEYVVAYLGALQA 59
                                                                                                                                                                                                                     GRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVD 119
                        FΑ
                                                DIGRREKLSYLSGTPSVLQQIELSR-----LPHLHMVTAAGEEFHASQFEKMRSQ
                                                                                                          SVVLDSPETLACLNQQSKENPTTSTQKPSDLAYVIFTSGTTGKPKGVLVEHQSVVQLRNS 2614
                                                                                                                                                                     LLDLDAPN-----GYTFKEDEYPST-----AYLQYTSGSTRTPAGVVMSHQNVRVNFEQ
                                                                                                                                                                                              GAAYVPLDPT---YPSQRTELILEESSARTLITTR-----KHTPR-----GGTVANVP
                                                                      MHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADR
                                                                                                LIERYFGETNG----SHAVLFLSNYVFDFSLE-QLCLSVLGGNKLII-PPEEGLTHEAFY
                                                                                                                                                                                                                                                                                                69;
                                                                                                                                                                                                                                                                                                           Similarity
                        290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Phosphopantetheine
                                                                                                                                                                                                                                                                                                                                                                                   234
1335
2409
795
1880
2960
2960
827
1916
                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                            ΑA;
                                                                                                                                                                                                                                                                                                                                                                                   1062
2162
3387
864
1953
3027
827
1916
                                                                                                                                                                                                                                                                                                           10.4%; 22.8%;
                                                                                                                                                                                                                                                                                                                                                            414767
                                                                                                                                                                                                                                                                                             55;
                                                                                                                                                                                                                                                                                                                                                          ACYL CARRIER (ACP).

ACYL CARRIER (ACP).

ACYL CARRIER (ACP).

ACYL CARRIER (ACP).

PHOSPHOPANTETHEINE (BY SIMILARITY).

PHOSPHOPANTETHEINE (BY SIMILARITY).

PHOSPHOPANTETHEINE (BY SIMILARITY).

THIOESTERASE (BY SIMILARITY).

7 MW; 4EE3CLEB5EBEF9B7 CRC64;
                                                                                                                                                                                                                                                                                                                                                            ¥
E
                                                                                                                                                                                                                                                                                            Pred. No. 0.00
5; Mismatches
                                                                                                                                                                                                                                                                                                          Score 160.5; DB 1; Pred. No. 0.00017;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN 1 (ADIPATE-ACTIVATING).
DOMAIN 2 (CYSTEINE-ACTIVATING).
DOMAIN 3 (VALINE-ACTIVATING).
                                                                                                                                                                                                                                                                                                129;
                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                       3712;
                                                                                                                                                                                                                                                                                                49;
                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                       168
                                                2718
                                                                                               2668
                                                                                                                        228
```

11;

Search completed: January 5, 2001, 14:31:21 Job time: 352 sec

```
Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                             tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                          Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
   Score
                                                                                                                                                                                                                                                                                                                                                                                                                                    seq
                                                                                                                                                                                                                                                                                                                                                                                                                                    length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                              PIR_66:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*
                                                                                                                                                                                                                                                                  Query
Match
   BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          January 5, 2001, 14:28:34; Search time 67.42 Seconds (without alignments) 302.139 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-461-774-6
1540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               195891 seqs, 67900655 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 DYEQDWDGVAITLTRSQLYR.....TIKRFADRFARFNLQERVKA 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                               pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                                                                  Length
   .
DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gapext 0.5
                    H83343
A70635
T34918
T18551
T18551
T18551
T10707
A70709
JX0340
H70739
JX0340
T36248
T316248
T316248
T316248
T316248
T316248
T316248
T316248
T316248
T316248
                                                                                                                                                                                                       S72711
A70723
A70877
                                                                                                                                                                                                                                B70668
B70820
F70522
                                                                                                                                                                                      B70749
C70669
                                                                                                                                                                    E70887
                                                                                                                                                                               C70634
                                                                                                                                                                                                                                                                   ij
                                                                                                                                                                                                                                                                                            SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                              195891
                                                                    probable polyketid probable polyketid masC protein Myc probable acyl-coAs probable acyl-coAs probable acyl-coA probable acyl-coA probable fadD30 pr probable fadD30 pr probable fadD31 pr probable fadD31 pr probable fadD31 pr polyketide synthas saframycin Mx1 syn type I fatty acid probable acyl-CoA probable polyketid mycosubtilin synth probable polyketid gramicidin S synthe CDA peptide synthe
tyrocidine synthet peptide synthetase gramicidin S synth probable polyketid probable fadD7 proprobable long-chailysobactin synthet long-chain-fatty-a
                                                                                                                                                                                                                                                                 Description
                                                                                                                                                                                                                                                 probable Acyl-CoA
 RESULT
B70820
           N
```

Result

Database

Searched:

Sequence: Title: Run on:

45	44	43	42	41	40	39	38	37	36	ω 5	34	ω ω	32	31	30
168	168.5	170	170	170	170.5	170.5	170.5	171.5	172	172.5	173	176.5	176.5	177	177.5
10.9	10.9	11.0	11.0	11.0	11.1	11.1	11.1	11.1	11.2	11.2	11.2	11.5	11.5	11.5	11.5
560	547	1809	1809	550	4077	879	552	2611	1394	2591	7576	9376	557	3670	8563
N	2	N	N	H	N	N	Ŋ	N	Ŋ	N	N	N	2	2	2
D69649	A70551	C83118	T17403	A26772	T17484	B70014	E69438	T14591	T34061	T30288	T17428	T14593	н69678	T36249	T30226
<pre>probable long-chai</pre>	probable acidCoA	pyochelin syntheta	pyochelin syntheta	Photinus-luciferin	hypothetical prote	antibiotic synthet	probable fatty-aci	actinomycin synthe	hypothetical prote	pristinamycin I sy	FK506 polyketide s	syringomycin synth	involved in polyke	CDA peptide synthe	polyketide synthas

Qy 61 RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120 4	Query Match 98.6%; Score 1519; DB 2; Length 580; Best Local Similarity 99.3%; pred. No. 1.3e-115; Matches 296; Conservative 1; Mismatches 1; Indels 0; Gaps 0; Qy 1 DYEODWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60 1	RESULT 1 B70668 probable Acyl-CoA Synthetase - Mycobacterium tuberculosis (strain H37RV) C;Species: Mycobacterium tuberculosis C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 18-Aug-2000 C;Accession: B70668 R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Gordon; Connor, R.; Davles, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Harris, D.; Gordon; Connor, R.; Davles, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Harris, D.; Gordon; Connor, R.; Davles, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Squares, S.; Nature 393, 537-544, 1998 A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete geno A;Reference number: A70500; MUID:98295987 A;Accession: B70668 A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Molecule type: DNA A;Residues: 1-580 <col/> A;Genetics:	35 172.5 11.2 2591 2 T30288 pristinamycin I sy 36 172 11.2 11.2 11.34 2 T34061 hypothetical prote 37 171.5 11.1 2611 2 T14591 actinomycin synthetical prote 38 170.5 11.1 552 2 E69438 probable fatty-aci 39 170.5 11.1 879 2 B70014 antibiotic synthet 40 170.5 11.1 4077 2 T17484 hypothetical prote 170 11.0 550 1 A26772 photinus-luciferin 42 170 11.0 1809 2 T17403 probable acid-row 43 170 11.0 1809 2 T17403 pyochelin syntheta 44 168.5 10.9 547 2 A70551 probable acid-cow 45 168 10.9 560 2 D69649 probable long-chai

0;

```
probable polyketide synthase - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 18-Aug-2000
C;Accession: F70522
R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Gord; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Holroy Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S.
Nature 393, 537-544, 1998
A;Authors: Squares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G.
A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete ge A;Reference number: A70500; MUID:98295987
A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Residues: 1-584 <COL>
A;Crooss-references: GB:297188; GB:AL123456; NID:g3261805; PIDN:CAB10005.1; PID:g222
A;Experimental source: strain H37Rv
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      probable polyketide synthase MTCY409 - Mycobacterium tuberculosis (strain H37RV) C;Species: Mycobacterium tuberculosis C;Species: Mycobacterium tuberculosis C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 18-Aug-2000 C;Accession: B70820 C;Accession: B70820 G;Accession: B70820 G;Accession: B70820 G;Accession: R70820 G;Accession: B70820 G;Accession: B70820 G;Accession: B70820 G;Accession: B70820 G;Accession: Grander, T.; Churcher, C.; Harris, D.; G;Accession: B70820 G;Accession: Grander, T.; Churcher, C.; Harris, D.; G;Accession: Grander, G.; Grander, T.; Churcher, C.; Harris, D.; G;Accession: Grander, G.; Harris, D.; G;Accession: Grander, G.; Harris, D.; G;Accession: Grander, G.; Harris, D.; G;Accession: G;Ac
A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    γΩ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: GB:AL022000; GB:AL123456; A;Experimental source: strain H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-584 <COL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Authors: Sgares, R.; Sulston, J.E.; Taylor, K.; A; Title: Deciphering the biology of Mycobacterium A; Reference number: A70500; MUID:98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Status: preliminary; nucleic acid sequence not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: B70820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            iuperfamily: 4-coumarate--CoA ligase; acetate--CoA ligase homology
8-570/Domain: acetate--CoA ligase homology <ACL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27
       fadD23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         fadD24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RFN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LLARNGRTISAGPNFAFELAVRKTSDDDMDGLDLAGVHTILNGSERVHPATLKRFAERFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADFFAPEGGVVPPDLTVVSWLPLYHDMGLLLGAIMPILAGVPTVLTSPVGFLQRPARWIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDLDA------PNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLM 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RIAVPLPVPHAGAHDERTISVLSDTSPAVILTTSGAVDDVRECAQPQPGQSAPSIVELDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RIAVPLSVPQGGTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DYEQDWAGVAETLTWSQLYRRMLNVAEPLRHVGATGDRAVILAPQGIEYVVGFLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LDLDSRQRSRSPGARPTG-----RDTPETAYLQYTSGSTRTPAGVMVSNKNVFANFEQIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity 62.7
90; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62.0%;
62.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 954.5; DB 2
Pred. No. 9.1e-70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NID: g3261541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Whitehead, S.; Barrell, tuberculosis from the c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PIDN:CAA17589.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         201
                                                                                                                                                                                                                                                                                                                     complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B.G.
                                                                                                   PID:g2224819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PID:g29169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gordon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gordon,
                                                                                                                                                                                                                                                                                                                     genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
```

```
masC protein - Mycobacterium leprae
N;Alternate names: Lepb1170_F1_11 protein
C;Species: Mycobacterium leprae
C;Date: 19-Mar-1997 #sequence_revision 25
C;Accession: S72711
R;Smith, D.R.; Robison, K.
submitted to the EMBL Data Library, Noveml
A;Description: Mycobacterium leprae cosmio
Qy
                                В
                                                           Qy
                                                                                            DЬ
                                                                                                                       ΩV
                                                                                                                                                      DЬ
                                                                                                                                                                                  οy
                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: I
A; Residues: 1-372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C;Superfamily: 4-coumarate--CoA ligase; acetate--CoA ligase homology F;58-562/Domain: acetate--CoA ligase homology <ACL>
                                                                                                                                                                                                                                                                                                                                                     C; Superfamily:
                                                                                                                                                                                                                                                                                                                                                                     A; Gene:
                                                                                                                                                                                                                                                                                                                                                                                                   A; Cross-references:
                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Accession: S72711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Reference number:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          맑
                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                     Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                            147
   241
                                207
                                                              181
                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                        87
                                                                                                                                                                                     61
                                                                                                                                                                                                                  27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27
                                                                                                                                                                                                                                                                                                                                                                     masC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                 DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                DYEQDWAGVRKTLTWAQLYQRTLNVAHELRRHGSIRDRAVILAPQGLDYIIAFLGAMQAG
 AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQE
                                               PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWHLLMASDFHAFS
                                                                                         RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI 180
                               APLDLTIVSWLPFYHDMGLVLGVVAPILGGWRSELTSPISFLQRPARWIQAMATSSHPFS
                                                                                                                                                        FIAVPLSVPQAGSHDERVGAVLADTSPSVVLTTSAVADATAKYVDHSDTDTVPAILEVDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAPNEAFELTAAKAIDDDLAGLDLGRIKTILCGSERVHPATLKREVDRESRENLRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PPLDLFIMSWLPFYHDMGLVLGVCAPIIVGCGAVLTSPVAFLQRPARWLQLMAREGQAFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LIAVPLSAPLGGASDERVDAVVRDAKPNVVLTTSAIMGDVVPRVTPPPPGIASPPTVAVDQ 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDLDSPIRSNIVDDSLQTTAYLQYTSGSTRTPAGVMITYKNILANFQQMISAYFADTGAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            al Similarity 61.1
182; Conservative
                                                                                                                                                                                                                                                                                                                                                     masC protein
                                                                                                                                                                                                                                                                                                                                                                                                                                DNA
                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                               <SMI>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 #sequence_revision 25-Apr-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S72693
                                                                                                                                                                                                                                                                                                                                                                                                   EMBL: U00010;
                                                                                                                                                                                                                                                                                           60.5%;
60.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              47;
                                                                                                                                                                                                                                                                            48;
                                                                                                                                                                                                                                                                            Score 932; DB Pred. No. 3.3e
                                                                                                                                                                                                                                                                                                                                                                                                   NID: g466780;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 948; DB 2;
Pred. No. 3.1e-69;
7; Mismatches 67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         November 1993 cosmid B1170.
                                                                                                                                                                                                                                                                                           932; DB 2;
No. 3.3e-68;
                                                                                                                                                                                                                                                                                                                                                                                                    PIDN: AAA17075.1;
                                                                                                                                                                                                                                                                               69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #text_change
                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                    PID: 9466799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29-Sep-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
    296
                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                          180
                                                                                                                                                        146
                                                                                            206
                                                                                                                                                                                                                   86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           206
                                  266
                                                              240
                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60
```

0;

В

267

AGPNF AFELAARRTSDADIAGLDLGACQGIISGSERIHPATLNRFSDRFARINFRD

<u>س</u> • •

```
Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A;Authors: Squares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete A;Reference number: A70500; MUID:98295987
A;Accession: A70877
A;Status: preliminary; nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                   probable acyl-coAsynthase - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 18-Aug-2000
C;Accession: A70877
R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.;
Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; HC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete A;Reference number: A70500; MUID:98295987
A;Status: A70723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; H. Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G.
A;Molecule type: DNA
A;Residues: 1-578 <COL>
A;Cross-references: GB:AL010186; GB:AL123456; NID:g3261493; PIDN:CAA15862.1;
A;Experimental source: strain H37Rv
C;Genetics:
A;Gene: fadD21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    probable acyl-coAsynthase - Mycobacterium tuberculosis (strain H37RV) C;Species: Mycobacterium tuberculosis C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 18-Au C;Accession: A70723 R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Hag; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Haml
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C;Superfamily: acetate--CoA ligase; acetate--CoA ligase F;60-569/Domain: acetate--CoA ligase homology <ACL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Gene: fadD25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Molecule type: DNA
Residues: 1-583 <COL>
Cross-references: GB:877826; GB:AL123456; NID:g3261623;
Experimental source: strain H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Status: preliminary; nucleic acid sequence not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
mes 177; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KVAPPGSTVVSWLPFYHDMGFVLGLILPILAGIPAVLTSPIGFLQRPARWIQMLASNTLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LDLDA--PNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RIAVPLSVPQGGVTDERSDSVLSDSSPVAILITTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FTAAPNFAFDLASRKTKDEDMEGLDLGGVHGILNGSERVQPVTLKRFIDRFAPFNLDPK 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LDLDARPSSGSRSAAHGHPDILYLQYTSGSTRTPAGVMVSNKNLFANFEQIMTSYYGVYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IVAVPLSIPQGGAHDERTVSVFADTAPAIVLTASSVVDNVVEYVQPQPGQNAPAVIEVDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60.3%;
59.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 929; DB 2;
Pred. No. 1.1e-67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              #text_change 18-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PIDN:CAB01395.1; PID:g1477436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Holroyd,
                                                                         PID:g26959
                                                                                                                                                                                                                                                                                                                             Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ۲.
                                                                                                                                                                                                                                                                                                                                                     Gordon,
                                                                                                                                                                                                                            genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      genome
                                                                                                                                                                                                                                                                                                                             ß
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
```

```
Qy
                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the comple A;Reference number: A70500; MUID:98295987
A;Accession: B70749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
B70749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ωy
                                                             В
                                                                                                 Qy
                                                                                                                                               밁
                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                  C; Superfamily: 4-c F; 103-610/Domain:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Cross-references: GB:Z74697; GB:AL123456; NID:g3261602; A;Experimental source: strain H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Molecule type: DNA
A; Residues: 1-626 <COL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; H. Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          probable Acyl-CoA Synthetase - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000
C;Accession: B70749
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C;Superfamily: 4-coumarate--CoA ligase; acetate--CoA ligase homology F;58-564/Domain: acetate--CoA ligase homology <ACL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Gene: fadD26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Status; preliminary; nucleic acid sequence not shown; translation not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                Superfamily: 4-coumarate--CoA ligase; acetate--CoA;103-610/Domain: acetate--CoA ligase homology <ACL>
                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                  181
                                                                                                                                                 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  147
                                                             192
                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                            61
                                                                                                                                                                                                                                     72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27
                                                                                                                                                                                                                                                                                 _
PPPNSALVSWLPFYHDMGLYIGICAPILGGYPAVLTSPVSELQRPARWMHLMASDFHAFS 240
                                                                               LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI 180
                                                                                                                                                                      RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                              DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPPNSALVSWLPEYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWHHLMASDFHAFS 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DYEQDWAGITETLTWSEVERRTRIVAHEVRRHCTTGDRAVILAPQGLAYIAAFLGSMQAG 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AIAVPLSVPQIGSHDERVSAVLADASPSVILTTSAVAEAVAEHIHRPNTNNVGPI16IDS 146
                                                                                                                                               FIAVPLSTPQYGIHDDRVSAVLQDSKPVAILTTSSVVGDVTKYAASHDGQPAPVVVEVDL 191
                                                                                                                                                                                                                                     DYGSDPKGFADSLTWSQVYSRACIIAEELKLCGLPGDRVAVLAPQGLEYVLAFLGALQAG 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGI 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPDTTIVSWLPFYHDMGLVLGIIAPILGGYRSELTSPLAFLQRPARWLHSLANGSPSWS
                                                        LDLDSPRQMPAFSRQHTGAAYLQYTSGSTRTPAGVIVSHTNVIANVTQSMYGYFGDPAKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDLTG-NSPSFRVKDLPSAAYLQYTSGSTRAPAGVMISHRNLQANFQQLMSNYFGDRNGV 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 al Similarity
175; Conser
                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                            56.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58.9%;
59.1%;
                                                                                                                                                                                                                                                                                                                          40; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 906.5;
Pred. No. 7.1e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                            Score 869; DB 2;
Pred. No. 8.7e-63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5; DB 2;
7.1e-66;
hes 70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       ligase
                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PIDN:CAA98985.1; PID:g14059
                                                                                                                                                                                                                                                                                                                                                                                                                                                       homology
                                                                                                                                                                                                                                                                                                                       2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the complete
                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                        251
```

Holroyd,

geno

멍

252

--PTGTVVSWLPLYHDMGLILGICAPLVARRRAMLMSPMSFLRRPARWMQLLATSGRCFS

309

1;

```
submitted to the EMBL Data Library, September 1994
A;Description: Mycobacterium tuberculosis cosmid tbc2.
A;Reference number: $73053
A;Accession: $73071
A;Molecule type: DNA
A;Coss-references: EMBL:U00024; NID:g560506; PIDN:AAA50932.1; PID:g560511
A;Accession: $73072
A;Cross-references: EMBL:U00024; NID:g560506; PIDN:AAA50931.1; PID:g560510
A;Cross-references: EMBL:U00024; NID:g560506; PIDN:AAA50931.1; PID:g560510
C;Genetics: /M',413-619 <SMI2>
A;Cross-references: EMBL:U00024; NID:g560506; PIDN:AAA50931.1; PID:g560510
C;Genetics: A;Gene: fadD29
C;Superfamily: Synechocystis long-chain-fatty-acid--CoA ligase; acid-thiol ligase
F;95-619/Domain: acetate--CoA ligase homology #status atypical <ACL>
                           C70634
                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           R:Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; H. Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the comple ceference number: A70500; MUID:98295987
:cession: C70669
  probable fadD30
                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       probable acyl-CoA synthetase (EC 6.2.1.-) - Mycobacterium tuberculosis (strain N;Alternate names: hypothetical protein u0002q; hypothetical protein u0002r C;Species: Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Experimental source: strain H37Rv R; Smith, D.R.; Robison, K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000
C;Accession: C70669; S73071; S73072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Cross-references: GB:Z83018; GB:AL123456; NID:g3261671; PIDN:CAB05426.1; PID:g1694884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Molecule type: DNA
Residues: 1-619 <COL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Status: nucleic acid sequence not shown; translation not shown
                                                                                                                          301
                                                                                                                                                                                                                      244
                                                                                                                                                                                                                                                                                                                     184
                                                                                                                                                                                                                                                                                                                                                                                                                 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                          RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDV---VQHVARRPGESPPSIIE 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYDTDPAGFTETVTWWQVHRRAMIVAEELWIYASSGDRVAILAPQGLEXIIAFMGVLQAG 123
                                                                                                                          QISSAPNFGFELAVRRTSDDDMAGLDLGHVRTIVTGAERVNVATLRRFTERFAPFNLSE
                                                                                                                                                                                                                                                                                                                  VDALDLSSSRALDPTRFERPSTAYLQYTSGSTRAPAGVVLSHKNVITNCVQLMSDYIGDS
                                                                                                                                                                                                                                                                                                                                                                                                                 LIAVPLPVPQFGIHDERISSALRDSAPSIILTTSSVIDEVTTYAPHACAAQGQSAPIVVA 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60
                                                                                                                                                                 AFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNLQE
                                                                                                                                                                                                                   EKVP---STPVSWLPFYHDMGLMLGIILPMINQDTAVLMSPMAFLQRPARWMQLLAKHRA 300
                                                                                                                                                                                                                                                                DGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFH
                                                                                                                                                                                                                                                                                                                                                               VDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADT 177
  protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  53.4%;
  Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 823; DB 2;
Pred. No. 4.7e-59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
  tuberculosis
  (strain H37RV)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                          359
                                                                                                                                                                                                                                                                                                                  243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ð.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <SMI1>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gordon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       H37RV)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ഗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
Query Match
Best Local Similarity
```

```
A; Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; A; Title: Deciphering the biology of Mycobacterium A; Reference number: A70500; MUID:98295987 A; Accession: E70887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               probable fadD32 protein - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete A;Reference number: A70500; MUID:98295987
A;Accession: C70634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Species: Mycobacterium tuberculosis
C;Dates: Mycobacterium tuberculosis
C;Dates: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 18-Aug-2000
C;Accession: C70634
R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D; Connor, R.; Davies, R.; Parkhill, J.; Feltwell, T.; Gentles, S.; Hamlin, N.;
Connor, R.; Davies, R.; Davies, R.; Parkhill, J.; Feltwell, T.; Gentles, S.; Guares, S.; Squares, S.; Square
A; Gene: fadD32
C; Superfamily:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; He Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Gene: fadD30
C;Superfamily: acetate--COA ligase homology
F;58-569/Domain: acetate--COA ligase homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Cross-references: GB:Z84725; GB:AL123456; NID:g3261703; A;Experimental source: strain H37Rv C;Genetics:
                                                                                            A; Experimental C; Genetics:
                                                                                                                                                                                                                         A; Molecule type: DNA
A; Residues: 1-637 <COL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 1-585 <COL>
                                                                                                                                                                                    A; Cross-references: GB:AL022076;
                                                                                                                                                                                                                                                                                                            A; Status: preliminary; nucleic acid sequence not shown;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C; Accession: E70887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Status: preliminary; nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Nature 393, 537-544, 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
Matches 133; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    202 HEGGAPRLPSSVVSWLPLYHDMGLMVGLFIPLFVGCPVILTSPEAFIRKPARWMQLLAKH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDR---VVISAPQGLEYVVAYLGAL 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LD--TLDEPSGDNCDLDSQLSDWSSYLQYTSGSTANPRGVVLSMRNVTENVDQITRNYFR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VDLLDLDAPNGYTFKEDEYPS--TAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFA 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CAGWTPVPLPEPLGSLRDKRTGLAVLDCAADVVLTTSQAETRVRATIATHGASVTTPVIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DYDTKTGDQIDRMTWSQLYSRVTAVSAYLISYGRHADRRRTAAISAPQGLDYVAGFLGAL 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QAGRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIE
    4-coumarate--CoA ligase; acetate--CoA
                                                                                                                                      source: strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          39.3%; Score 604.5; DB 44.5%; Pred. No. 2.4e-41
                                                                                                                                 76; GB:AL123456;
H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                    NID: 93256026;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Whitehead, S.; Barrell, B.G. tuberculosis from the complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   #text_change 20-Jun-2000
    ligase homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                     translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIDN:CAB06604.1; PID:e12997
                                                                                                                                                                                    PIDN:CAA17865.1; PID:g295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Squares,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Holroyd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gordon
                                                                                                                                                                                                                                                                                                                                                                                                                                                       geno
```

31.4%;

Score Pred.

484; No.

1.6e-31;

Length 637

Ġ

```
A; Experimental : C; Genetics: A; Gene: PA2424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               probable non-ribosomal peptide synthetase PA2424 [imported] - Pseudomonas C;Species: Pseudomonas aeruginosa C;Species: Pseudomonas aeruginosa C;Date: 15-Sep-2000 #sequence_revision 15-Sep-2000 #text_change 15-Sep-200 C;Accession: H83343 R;Stover, C.K.; Pham, X.Q.; Erwin, A.L.; Mizoguchi, S.D.; Warrener, P.; Hi adman, S.; Yuan, Y.; Brody, L.L.; Coulter, S.N.; Folger, K.R.; Kas, A.; La
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
H83343
                          δÃ
                                                              В
                                                                                         Q
                                                                                                                            Вb
                                                                                                                                                       Qy
                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                         Db
                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-4342 <STO>
A; Cross-references: GB.AE004669; GB:AE004091; NID:g9948460;
A; Experimental source: strain PAO1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Title: Complete genome sequence of Pseudomonas aeruginosa A;Reference number: A82950 A;Accession: H8334 A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nature 406, 959-964, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    맒
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QY
                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                               211
                                                                                            185
                                                                                                                              155
                                                                                                                                                            125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    340 GLKQ 343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                110
269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                            95
                                                                                                                                                                                                                         67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                50
                                                                                                                                                                                                                                                          \frac{3}{5}
                                                                                                                                                                                                                                                                                                                                        Local
                                                                                                                                                                                                                                                                             DGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAGRIAVPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NLQE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMS---GYFADT
                            FAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFA--RFN 293
                                                                                  VAEAWDEPQVRPEHIAFLQYTSGSTALPKGVQVSHGNLVANEVLIRRGFGIGADDV----
                                                                                                                                                                                                                SVPQGGVT--DERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLLDLD
                                                                                                                                                                                                                                                         DGEGVVLSYRDLDLRARSIAAALQAHAQLGDRAVLLFPSGPDYVAAFFGCLYAGVIAVPA 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ETGGTFSAAPNFAFEHAAVRGVPRDDEPPLDLSNVKGILNGSEPVSPASMRKFFEAFAPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SDFHAFSAAPNFAFELAA-RRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VPTEVAATWQQPEANEETVAYLQYTSGSTRIPSGVQITHLNLPTNVVQVLNALEGQEGDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RIAVPLEDPAEPGHVGRLHAVLDDCAPSTILTTTDSAEGVRKFIRARSAKERPRVIAVDA
FAYRLCSERVAESALQRLDLSGWRVAFSGSEPIRQDSLERFAEKFAASRFD
                                                                                                                                                            APNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFEQLMSGYFADTDGIPPPN
                                                                                                                                                                                            YPPESARRHHQERLLSIIADAEPRLVLTTADLREPLLQMNAQLSAANAPQLLCVDQLDPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DFSTERDGVARDILWSDFSARNRAVGARLQQVTQPGDRVAILCPQNLDYLISFFGALYSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              115;
                                                                                                                                                                                                                                                                                                                          103;
                                                              ·IVSWLPLYHDMGLIGGLLQPIFSGVPCVLMSPRYFLERPVRWLEAISQYGGTVSGGPD
                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    296
                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VSWLPFFHDMGLITVLLASVL-GHSFTFMTPAAFVRRPGRWIRELARKPG
                                                                                                                                                                                                                                                                                                                                      29.2%;
                                                                                                                                                                                                                                                                                                                        49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              51;
                                                                                                                                                                                                                                                                                                                       Score 449; DB
Pred. No. 1.5e
49; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                    DB 2;
.5e-27;
                                                                                                                                                                                                                                                                                                                        129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 #text_change 15-Sep-2000
                                                                                                                                                                                                                                                                                                                                                     Length 4342;
                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                       PIDN: AAG05812.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PAO1,
                                                                                                                                                                                                                                                                                                                        10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P.; Hickey,
A.; Larbig,
                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   opportunistic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              109
                                                                                                                                                                                            154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                169
                                                                                            244
                                                                                                                                                            184
                                                                                                                                                                                                                                                                                       66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                            210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aeruginosa
                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPDB:GN00
                                                                                                                                                                                                                                                                                                                        ω.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  M.J.;
K.; Li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   patho
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .; Bı
Lim
```

```
18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A,Experimental source: strain H37Rv C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C;Accession: A70635
R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, Nature 393, 537-544, 1998
A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B. A;Authors: Sqares, R.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the comp A;Reference number: A70500; MUID:98295987
A;Accession: A70635
A;Status: preliminary; nucleic acid sequence not shown; translation not show A;Status: preliminary; nucleic acid sequence not shown; translation not show
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Gene: fadD31
C;Superfamily: acetate--CoA ligase homology
F;88-608/Domain: acetate--CoA ligase homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              probable fadD31 protein - Mycobacterium tuberculosis (strain H37RV)
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 18-Aug-2000
  Ъ
                                  Qy
                                                                        Вþ
                                                                                                          Ş
                                                                                                                                                      Вþ
                                                                                                                                                                                    Qy
                                                                                                                                                                                                                              ф
                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                          Dр
                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: DNA
A; Residues: 1-620 <COL>
A; Cross-references: GB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
346 L
                                                                                                                                                                                                                                  177
                                                                                                                                                                                                                                                                                                              117
                                      294 L
                                                                          290
                                                                                                                                                      232
                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                            61 RIAVPLSVPQGGYTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120.
                                                                                                                                                                                                                                                                                                                                                                                      57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12
                                                                                                                                                                                                                            RVVTAAPNFAYEWAAQRGLPAQGDDV--
                                                                                                                                                                                                                                                                                                                                                                                                                          DYEQDWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60
                                                                                                              HAFSAAPNFAFELAARR----TTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARFN
                                                                                                                                                    PPPNSALVSWLPFYHDMGL-VIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDF----
                                                                                                                                                                                                                                                                                                          TVAVPLFAPELPGHAERLDTALRDSEPAVILTTAAAKNAVEGFLNNVPRLRKPTVLVIDQ
                                                                                                                                                                                                                                                                                                                                                                                      DHARSAAGCALEVTWTQFGMRLAAIGAHVQRFAGPGDRVAILAPQGIDYVCGFYAAIKAG
    346
                                      294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                55; Mismatches 120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 426; DB 2; Pred. No. 7.9e-27;
                                                                        -DLSNVVLII-GSEPVSIDAVTTENKAFAPYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NID:g3261701;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  <ACL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIDN:CAB06501.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hamlin, N.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                          345
                                                                                                                293
                                                                                                                                                      289
                                                                                                                                                                                            236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PID:e29368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Holroyd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gordon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            geno
```

```
A; Gene: SCOEDB: SC3F7.12 C; Superfamily: 3-oxoacyl-[acyl-carrier-protein] synthase I homology; [acyl-carrier-protein]
                                               A; Experimental
C; Genetics:
                                                                                       A; Molecule type: DNA
A; Residues: 1-2297 <OLI>
A; Cross-references: EMBL
                                                                                                                                                                                                  submitted to the EMBL Data A; Reference number: Z21558
                                                                                                                                                                                                                                         C;Accession: T34918
R;Oliver, K.; Harris, D.; Parkhill,
                                                                                                                                                                                                                                                                            polyketide synthase - Streptomyces coelicolor
C;Species: Streptomyces coelicolor
C;Date: 05-Nov-1999 #sequence_revision 05-Nov-1999 #text_change 28-Jul-2000
                                                                                                                                                      A; Status: preliminary; translated
                                                                                                                                                                        A; Accession: T34918
                                                                                                                                                                                                                                                                                                                                                                           13
                                                                     source:
                                                                   EMBL:AL021409;
ce: strain A3(2)
                                                                                                                                                                                                           Library,
                                                                                                                                                        from
                                                                                       PIDN:CAA16183.1;
                                                                                                                                                                                                                    J.; Barrell,
January 1998
                                                                                                                                                        GB/EMBL/DDBJ
                                                                                                                                                                                                                                           B.G.;
                                                                                         GSPDB:GN00070;
                                                                                                                                                                                                                                             Rajandream,
                                                                                         SCOEDB: SC3F7
```

T34918 RESULT

Вb

285

ELCVRKISDEQKAGLDLSSWELAFCGAEPIRPDTLEAFSKAF

```
C:Species: Myxococcus xanthus
(;Date: 15-Oct-1999 #sequence_revision 15-Oct-1999 #t
C;Accession: T18551
R:Posplech, A.; Bletenhader, J.; Schupp, T.
Microbiology 142, 741-746, 1996
A:Title: Two multifunctional peptide synthetases and A:Reference number: Z18967; MUID:97090395
A:Accession: T18551
                                                                                         Qy
                  δõ
                                                        В
                                                                                                                                     Вþ
                                                                                                                                                                      γ
                                                                                                                                                                                                                  дδ
                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Molecule type: DNA
A;Residues: 1-1770 <POS>
A;Cross-references: EMBL:U24657; NID:g1171127; PID:g1171128; PIDN:AAC44128.
A;Experimental source: strain DM504-15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      saframycin Mx1 synthetase B - Myxococcus xanthus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            F;818-1205/Domain: 3-oxoacyl-[acyl-carrier-protein] synthase I homology <OAS>F;1315-1600/Domain: [acyl-carrier-protein] S-malonyltransferase homology <AMT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      uperfamily: acetate--CoA ligase homology 2-577/Domain: acetate--CoA ligase homology
                    248
                                                                                                                                                                                                                  125 ARDSRASVVLTTS-----FLQGLAGAMFELAPELGELSWV---ATDGIALEEAGAWKPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        284 ASTSVAPNFGFEQCLRRITPAQRAGLDLSRWRLALNGAEPIRPDTLDRFAEYFA 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           112
                                                                                                                                                                                                                                                                                               65
                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              safB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          G
ELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRF
                                                                                             VSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFSAAPNFAF 247
                                                                                                                                                                                                                                                       LSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLLDLDAPNGYTFKED-----
                                                                                                                                                                                                                                                                                             IAARLQADGRVGERALLLYAPGPEYVAAFFGCLYAGVVAVPVYPPDTARLERSLLRLRTV 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFA 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VIWLPPYHDMGLIGGVLTPIFGGLPVDLMSPLSFLQEPLRWLKTLSERRGTCSGGPNFAY
                                                                                                                                     LSGDSVAFLQYTSGSTADPKGVVLTHRNLMHNLSVIHERFQLNRG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DLYTGESTTAWEDPGATARSLAFLQYTSGSTAAPKGVMVEHGNLVRNLRSIHLRLGHDAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PAYPPDNARFGQTVPRLAAIARDCAATHALTTRRVRETVAADGTGRVGTELDGVRWLVTE 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DTDGTSVAWTYRELDLHAREVATHLRHAGVGQGPVLLLHPPGLDYLAAFFGCLYAGAVAV 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DWDGVAITLTRSQLYRRTLNVAQELSRCGSTGDRVVISAPQGLEYVVAYLGALQAGRIAV
                                                                                                                                                                          -EYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFE-----QLMSGYFADTDGIPPPNSAL 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DLDAPNGYTFKED---EYPSTAYLQYTSGSTRTPAGVVMSHQNVRVNFE--QLMSGYFAD 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PLSVPQG----GVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDLL 121
                                                                                                                                                                                                                                                                                                                                                                             99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                         25.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27.3%;
                                                                                                                                                                                                                                                                                                                                                                           39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 38; Mismatches 133;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 421; DB 2;
Pred. No. 1.2e-25;
                                                                                                                                                                                                                                                                                                                                                                                           Score 386.5; DB 2; Pred. No. 5.3e-23;
                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            <ACL>
                                                                                                                                                                                                                                                                                                                                                                           107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    #text_change 18-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 2297;
                    289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       an
                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                               Length 1770;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       O-methyltransferase
                                                                                                                                                                                                                                                                                                                                                                         37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16;
                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              231
                                                                                                                                     224
                                                                                                                                                                                                                                                       134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         are involve
                                                                                                                                                                                                                                                                                                                                                                         6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4;
```

Job time: 262 sec

January

5, 2001,

14:28:41

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C;Superfamily: 3-oxoacyl-[acyl-carrier-protein] synthase I homology F;906-1308/Domain: 3-oxoacyl-[acyl-carrier-protein] synthase I homology <OAS1>F;3062-3463/Domain: 3-oxoacyl-[acyl-carrier-protein] synthase I homology <OAS2:F;5274-5689/Domain: 3-oxoacyl-[acyl-carrier-protein] synthase I homology <OAS3:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R; Zhu, G.; Marchewka, M.J.; Woods, K.M.; Upton, submitted to the EMBL Data Library, August 1998 A; Description: Characterization of a type I FAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          type I fatty acid synthase homolog - Cryptosporidium parvum C;Species: Cryptosporidium parvum C;Species: Cryptosporidium parvum C;Date: 22-Oct-1999 #sequence_revision 22-Oct-1999 #text_change 28-Jul-2000 C;Accession: T31307 R;Zhu, G.; Marchewka, M.J.; Woods, K.M.; Upton, S.J.; Keithly, J.S.
                                       Qy
                                                                                          밁
                                                                                                                                       Qγ
                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                       οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   р
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Molecule type: DNA
A; Residues: 1-8243 <ZHU>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: preliminary; translated from A;Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Reference number: Z20993
A; Accession: T31307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Note: FAS1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Cross-references: EMBL:AF082993; NID:g4092068; PID:g4092069; PIDN:AAC99407.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                      183
                                                                                                                                                                                                                                                                                245
                                                                                                                                                                                                                                                                                                                                 152
                                                                                                                                                                                                                                                                                                                                                                                188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  σ
VFAILSGAEPIRKTTIDRFTEAFKSVGIKHNV
                                         ILTILSGSERVQAATIKRFADRFARFNLQERV
                                                                                      EFFGCNIFQMSDIDFIKKPYLMMQCMDKYNCSVSGAPNEAFEVVVRKTPKEILNQLNLKH
                                                                                                                                       ILGGYPAVLTSPVSFLQRPARWMHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGN
                                                                                                                                                                                                                                                                                   PKGVMVTHGNLLYNIHICISSYSFPSVLEEHYKNELDSIPAGITVLKKNELTEDELSFTH
                                                                                                                                                                                                                                                                                                                               PAGVVMSHQNVRVNFEQLMSGYF------ADTDGTPP-----
                                                                                                                                                                                                                                                                                                                                                                              FEATDNLKIRKEEYINEVQKAINDIILND---SNHFDFLGFDFNINTVAFLQFTSGSTSQ 241
                                                                                                                                                                                                                                                                                                                                                                                                                          --AVDDVVQHVARRPGESPPSIIEVDLLDLDAPNGYTFKEDEY--PSTAYLQYTSGSTRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GIVAVPVYPPDPMRGQSEIQRFCDIKQASETNISLTCTSYMRSIEIAKTMSTDKRFKSIR 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GRIAVPLSVP---QGGVTDERSDSVLSDSSPVAILTTSS------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WIGSNGDIKKKFTYREFFEKVVELSWYLSKKLGIKAGDKVILCYTPGYDFVIAFTTCLVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WDGVAITLTRSQLYRRTLNVAQELS----RCG-STGDRVVISAPQGLEYVVAYLGALQA 59
                                                                                                                                                                                        NEFGEEKNIMSLNDIKYDKLYLYMSIINKVLYKNTMSSASVFSWLPVYHDMGLIGFFCTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 Similarity 24.2 95; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20.18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; Score 310; DB 2; I
; Pred. No. 6.9e-16;
58; Mismatches 137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GB/EMBL/DDBJ
                                            298
                                                                                                                                                                                                                                  ---PNSALVSWLPFYHDMGLVIGICAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 8243;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parasitic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protozoon
                                                                                                                                                                                                                                                                                                                                                                                                                  151
                                                                                                                                                                                                                                    206
                                                                                                                                                                                                                                                                                   304
                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   127
                                                                                                                                                                                        364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <0AS3>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <0AS2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Crypt
```

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on:
          Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
       161.5
160.5
160.5
144
143
139
129
128.5
124
128.5
119
119
1119
1119
1119
1116.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                seq
seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Issued_Patents_AA:*

1: /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
2: /cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
3: /cgn2_6/ptodata/2/iaa/6_COMB.pep:*
4: /cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
5: /cgn2_6/ptodata/2/iaa/backfiles1.pep:*
          111.2
111.0
111.0
111.0
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
110.9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           174772 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-461-774-6
1540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          January 5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DYEQDWDGVAITLTRSQLYR.....TIKRFADRFARFNLQERVKA 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                       15281
739
552
552
797
768
3666
3727
3778
552
552
548
548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          549
550
550
815
550
550
3712
3665
3712
1410
798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version 4.5
(c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2001, 14:27:24 ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               17957048 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gapext 0
US-08-474-169-8
US-08-354-240A-2
US-08-867-352-2
US-08-867-352-2
US-08-122-520C-9
US-08-354-240A-6
US-08-354-240A-6
US-08-222-617A-13
US-08-222-617A-25
US-08-222-617A-25
US-08-222-617A-2
US-08-223-1729B-6
US-09-111-752-7
US-07-675-211-2
US-08-07-675-211-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Search time 45.19 Seconds (without alignments)
119.210 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           174772
   sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
sequence
seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Description
                            5, Appli
2, Appli
4, Appli
4, Appli
4, Appli
4, Appli
1, Appli
5, Appli
6, Appli
1, Appli
2, Appli
2, Appli
2, Appli
2, Appli
2, Appli
3, Appli
2, Appli
2, Appli
2, Appli
3, Appli
3, Appli
4, Appli
5, Appli
6, Appli
7, Appli
7, Appli
7, Appli
7, Appli
8, Appli
9, 
                                   Š
                                   126
                                   ----PNGYTFKEDEYP---
```

20	Оу	Оу	3 H O	C		
126	68 114	58 58	Query M Best Lo Matches	RESULT 1 US-08-474-1 Sequence Patent No Patent NO PATENT TITLE INUMBER CORRES ADDR STRE COUN ZIP: COMPUT CO		4 4 4 4 4 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3
PNG:	VPQGGVTDERS : : APANDIYNERE	VAITLT : : : IEVNIT	Match Local Simi es 77;	169 169 1 IN I		108 108 108 108 108 108 108 108 108 108
GYTFKEDEY 		RSQLYRRTLNVAQE :: : : : : YAEYFEMSVRLAEA	ilarity Conserv	69-8 8, Application US/0 1851796 1NFORMATION: ANT: SCHALL, David OF INVENTION: An A OF INVENTION: An A OF INVENTION: Syst OF SEQUENCES: 8 PONDENCE ADDRESS: ESSEE: STERNE, KES ET: 1100 New York : Washington E: DC TRY: USA 20005 ER READABLE FORM: UM TYPE: Floppy di UMTFR: IBM PC COMPA WARE: PSTENN: PC-D-D ATING SYSTEM: PC-D-D MUNICATION NUMBER: US ICATION NUMBER: US SIFICATION INFORMA PHONE: 202-371-260 PHONE: 202-371-260 PHONE: 202-371-260 PHONE: 202-371-260 PHONE: 102-371-260 PHONE: 202-371-260 PHONE: 202-371-260 PHONE: 102-371-260 PHONE: 202-371-260 PHONE:		77777777777777
EYP	VLSDSS :: SMNISQ	VAITLTRSQLYRRTLNVAQELSRCG : : : :: : : : IEVNITYAEYFEMSVRLAEAVKRYG	11.2 24.7 ative	David An P Syst Syst Syst Compa Compa DATA I		1336 2324 2324 2324 2327 2327 2446 161 161 161 161 161 161 161 161 163 636
	PVAILTTS : : PNVVLVSK	. S	%; Score %; Pred. 59; Mi	17416 3. 3. 1. Coreg 1 for 1 f	Đ.	2 US-08 4 PCT-U 1 US-08 1 US-08 4 PCT-U 5 4551 5 US-08 6 US-08 7 US-08 8 US-08 9 US-08
: S	SSAVDDVVQ : :: KKGLQKIL-	-STGDRVVIS : : : LNTNHRIVVF	re 172; DI d. No. 7.50 Mismatches	nducib nducib LDSTEI te 600 te 600	ALIGNMENTS	593- 593- 58-1 016- 510 460 782 782 782
TAYLQYTSGS	HVARR : :: NVOKK	SAPQGLE : : FSENSLQ	3 2; 3-10	e Gene & FOX & FOX	rs	356-6 112687-6 1857-1 19819-1 19819-1 2366A-12 356-2 356-2 356-2 1852D-30 646B-31 1934-2 118-2 118-6 1118-6 1118-6 1118-9
SGSTRTP	ES	APQGLEYVVAYLGALQAG : ::: SENSLQFFMPVLGALFIG	Length;; Inde	cline-Re Express P.L.L.C		
TRTPAGVVMSHQNVRV	PPSIIEVDLLDLDA- :: :: LPIIQKIIIMDLKTD	('21	561; ls 6	ion in		Sequence Sequence Sequence Sequence Patent No. Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence
_	DLDA- 1 DLKTD 1	TAVPLS 6	2; Gaps	d Eucaryot		1, 54 1, 54
64	125 168	67 L13	os 18;	··· Cottes		Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli Appli

```
용
                                                                              밁
                                                                                                                δÃ
                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 2
US-08-718-425-5
US-08-718-425-5
: Sequence 5, Application US/08718425
: Patent No. 6132983
: Patent No. 6132983
                                    Q
                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                      ; MOLECULE TYPE: protein US-08-718-425-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEFAX: (703) 816-4100 INFORMATION FOR SEQ ID NO: 5:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE/DOCKET NUMBER: 12
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 816-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Arthur R. Crawford
REGISTRATION NUMBER: 25,327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Murray, James A. H. APPLICANT: Squirrell, David J. TITLE OF INVENTION: LUCIFERASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
163 SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT 214
                                          109
                                                                            103 APANDIYNERELLNSMNISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             331 SKEVGEAVAKRF 342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                221 FLQRPARWHHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               169
                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS:
TOPOLOGY: un
                                                                                                                       83
                                                                                                                                                             47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: US/0 FILING DATE: 20-NOV-1996 CLASSIFICATION: 435
                                                                                                                                                                                                                                                          Local
                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET:
                                                                                                                                                                               9 VAITLITRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS : : : : : : : | | | : | : | : | | : | : | : | : | : |
                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADDRESSEE:
                                      -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                     VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP-----
                                                                                                                                                       IEVNITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV--- 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESHARDPIEGNO---IIPDTAILSVVPEHHGEGMETTLGYLIC----GERVVL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGGAPL 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTSPVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YQGFQSMYTFVTSHLPPGFNEYDFVPESFDRDKTIALIMNSSGSTGLPKGVALPHRTACV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : Arlington 
IRY: U.S.A. 
22201-4714
                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                               550 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               E: Nixon & Vanderhye
1100 No. 6132983th Glebe Road, 8th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lowe, Christopher R
White, Peter J.
                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                         unknown
                                                                                                                                                                                                                                                                                                                                                                                           single
                                                                                                                                                                                                                                                      11.1%; Score 171; DB 3; 23.5%; Pred. No. 9.3e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LUCIFERASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US/08/718,425
                                                                                                                                                                                                                                        Mismatches 118;
                                                                                                                                                                                                                                                                          Length 550;
                                                                                                                                                                                                                                        Indels 68;
                                                                                                                                                                                                                                   Gaps
                                                                                                                     108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               228
                                                                                                                                                                                                                                     17;
```

```
밁
                                                                                           Q
                                                                                                                                  DЬ
                                                                                                                                                                     Qγ
                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-354-240A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                Query Match 11.0%; Score 170; DB 1; Best Local Similarity 23.5%; Pred. No. 1.2e-09; Matches 74; Conservative 54; Mismatches 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 2, Application US/08354240A Patent No. 5670356 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEFAX: 608-831-2106 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REGISTRATION NUMBER: 30,492
REFERENCE/DOCKET NUMBER: 34
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                               LENGTH: 549 amino acids
TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE CHARACTERISTICS:
LENGTH: 549 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY/AGENT INFORMATION: NAME: Sara, Charles S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Sherf, Bruce PAPPLICANT: Wood, Keith V.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE OF INVENTION:
162 VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS 217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      163 SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT 214
                                                                                               109
                                                                                                                                  103 APANDIYNERELLNSMNISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          317 APLSKEVGEAVAKRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           274 ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: US/08/354,240A FILING DATE: 12-DEC-1994 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                          47 IEVNITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV--- 102
                                                                                                                                                                       68 VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP----- 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY: USA
ZIP: 53717-1914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STREET:
                                                                                                                                                                                                                                   9 VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPI.S 67.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                             -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Madison
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ΣH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8000 Excelsior Drive, Suite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sherf, Bruce A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               608-831-2100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MODIFIED LUCIFERASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    30,492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        34506.029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .C.
                                                                                                                                                                                                                                                                                                                     Length 549
                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                      68;
                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          264
                                                                                                                                                                                                                                                                                        17;
```

```
US-08-867-352-23; Sequence 23, Application US/08867352; Patent No. 6060273;
RESULT 5
US-08-718-425-2
; Sequence 2, Application
; Patent No. 6132983
                                                                                                  В
                                                                                                                               Q
                                                                                                                                                               Ъ
                                                                                                                                                                                            Ş
                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                            Ф
                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; MOLECULE TYPE: protein US-08-867-352-23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
LENGTH: 550 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOTTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE OF INVENTION: MUNUMBER OF SEQUENCES: 2'COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION DATA:
                                                                                                                                  274
                                                                                                                                                                265
                                                                                                                                                                                                                                                                                                                                                              103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        265
                                                                                                  317 APLSKEVGEAVAKRF
                                                                                                                                                                                                                               215
                                                                                                                                                                                                                                                                                              163
                                                                                                                                                                                                                                                                                                                              109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       215
                                                                                                                                                                                                                                                            162 VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS 217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   274 ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                             47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity 23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                           68 VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP----- 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: US/08/867,352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                               ---SERVQAATIKRF
                                                                                                                                                                                                                             ACVRFSHARDPIFGNQ---IIPDTAILSVVPFHHGFGMFTTLGYLIC-----GFRVVL--
                                                                                                                                                                                                                                                                                              SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT
                                                                                                                                                                                                                                                                                                                                                           APANDIYNERELLNSMNISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                           VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APLSKEVGEAVAKRF 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGG 316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACVRFSHARDPIFGNQ----IIPDTAILSVVPFHHGFGMFTTLGYLIC-----GFRVVL--
                                                                                                                                                                                            PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG- 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG- 273
                                                                                                                                                                                                                                                                                                                            -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                           IEVNITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV--- 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            74;
                                                                                                                                                             -MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Multicistronic expression units and their use 25
                                                                                                                                285
                  US/08718425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08/387,847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          54; Mismatches 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 170; DB 3; Pred. No. 1.2e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Version #1.25 (EPA)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                              214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            17;
US-08-122-520C-9
Sequence 9, Application US/08122520C; Patent No. 5639663; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                         QУ
                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                망
                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                               109
                                                                                                                                                                                                                                                                                                                                                                             103
                                                                                                                                                                                                                                                                                                             163
                                                                                                                                                                                                                                                                                                                                                                                                            68
                                                                                                                                                                                                                                                                                                                                                                                                                                            47
```

```
; TYPE: amino a ; STRANDEDNESS: ; TOPOLOGY: unk ; MOLECULE TYPE: US-08-718-425-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
APPLICANT: Lowe,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEFAX: (703) 816-410 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08,
FILING DATE: 20-NOV-1996
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER: 12
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 816-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Squirrell, TITLE OF INVENTION: LI NUMBER OF SEQUENCES: 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
317 APLSKEVGEAVAKRF 331
                                                                                    274 ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CITY: Arlington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME: Arthur R. Crawford
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9 VAITLITRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67 : : : | : : : | | : | : | | : | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : |
                                                                                                                                                                                                                                                                                                                                                                                                                                               VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS 217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IEVNITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV--- 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP------ 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APANDIYNERELLNSMNISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ 162
                                                                                                                                                                             ----MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHE!ASGG 316
                                                                                                                                                                                                                                                             PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG- 273
                                                                                                                                                                                                                                                                                                                                                          ACVRESHARDPIFGNQ---IIPDTAILSVVPFHHGFGMFTTLGYLIC-----GFRVVL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22201-4714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    550 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   E: Nixon & Vanderhye
1100 No. 6132983th Glebe Road,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Murray, James A. H. Squirrell, David J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    White, Peter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Release #1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lowe, Christopher R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            816-4100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LUCIFERASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11.0%; Score 170; DB 3; 23.5%; Pred. No. 1.2e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25,327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/08/718,425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8th Floor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps '
                                                                                                                                                                                                                                                                                                                                                          264
```

```
US-08-354-240A-4
Sequence 4, Application US/08354240A
Patent No. 5670356
GENERAL INFORMATION:
APPLICANT: Sherf, Bruce A.
APPLICANT: Wood, Keith V.
                                                                                                                                                                                                                                                      밁
                                                                                                                     RESULT
                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                 γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-122-520C-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: ASCII text
CURRETT APPLICATION DATA:
CAPPLICATION NUMBER: US/C
FILING DATE: 11/29/92
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME: Anderson, J. Wayne REGISTRATION NUMBER: 28.158 REGISTRATION NUMBER: 10013-1A TELECOMMUNICATION INFORMATION: TELEPHONE: (613) 993-3899
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Selvaraj, Gopalan
TITLE OF INVENTION: BIFUNCTIONAL GENETIC MARKERS
NUMBER OF SEQUENCES: 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ATTORNEY/AGENT INFORMATION: NAME: Anderson, J. Wayne
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET: ...
STREET: ...
Ottawa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                  274 ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                 162 VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS 217
                                                                                                                                                                          317 APLSKEVGEAVAKRF 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE: J. Wayne Anderson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9 VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH:
                                                                                                                                                                                                                                                      ----MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGG
                                                                                                                                                                                                                                                                                          PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG- 273
                                                                                                                                                                                                                                                                                                                             ACVRFSHARDPIFGNQ --- IIPDTAILSVVPFHHGFGMFTTLGYLIC ---- - GFRVVL --
                                                                                                                                                                                                                                                                                                                                                                                                                                               -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APANDIYNERELLNSMNISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP------ 108
                                                                                                                                                                                                                                                                                                                                                                                                         SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IEVNITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV--- 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  K1A 0R6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            815 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Montreal Rd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Crosby, William L.
Datla, Raju S.S.
Hammerlindl, Joesph K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CANADA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.0%;
23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/08/122,520C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         54; Mismatches 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 170; DB 1;
Pred. No. 2.2e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1; Length 815;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           68;
                                                                                                                                                                                                                                                      316
                                                                                                                                                                                                                                                                                                                                                                                                         214
                                                                                                                                                                                                                                                                                                                               264
```

17;

밁 QУ

DЬ Qy В δÃ В Qy В Qγ

Sequence 6, Application US/08354240A Patent No. 5670356 GENERAL INFORMATION:

APPLICANT: Sherf, Bruce A.
APPLICANT: Wood, Keith V.
TITLE OF INVENTION: MODIFIED LUCIFERASE
NUMBER OF SEQUENCES: 20

CORRESPONDENCE ADDRESS

```
RESULT 8
US-08-354-240A-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; TOPOLOGY: linear; MOLECULE TYPE: protein US-08-354-240A-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME: Sara, Charles S.
REGISTRATION NUMBER: 30,492
REFERENCE/DOCKET NUMBER: 3450
TELECOMMUNICATION INFORMATION:
TELEPHONE: 608-831-2100
TELEFAX: 608-831-2106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION: NAME: Sara, Charles S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: MODIFIED LUCIFERASE
NUMBER OF SEQUENCES: 20
CORRESPONDENCE ADDRESS:
ADDRESSEE: DeWitt Ross & Stevens, S.G.
STREET: 8000 Excelsior Drive, Suite 401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION DATA:
                                                                                                                                                                                      265
                                                                                                                                                                                                                              218
                                                                                                                                                                                                                                                                                                                                                                      163
                                                                                                                                                                                                                                                                                                                                                                                                                   109
                                                                                                                                                                                                                                                                                                                                                                                                                                                               103
                                                                                             317 APLSKEVGEAVAKRF
                                                                                                                                          274 ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                     162 VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS 217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE: 12 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9 VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67
: : | :: : : : : | | : | | :| : : | | : : | | | | :|
                                                                                                                                                                                                                            PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG- 273
                                                                                                                                                                                                                                                                                                                                                                      SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                             APANDIYNERELLNSMGISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP------ 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IEVDITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV--- 102
                                                                                                                                                                                    ----MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGG
                                                                                                                                                                                                                                                                           ACVRESHARDPIFGNQ --- IIPDTAILSVVPFHHGFGMFTTLGYLIC ----- GFRVVL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                53717-1914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Madison
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ΣH
                                                                                                                                                                                                                                                                                                                                                                                                              --GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               550 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     омыER: US/08/354,240A
12-DEC-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10.9%; Score 168; DB 1; Length 550; 23.5%; Pred. No. 1.9e-09; ative 53; Mismatches 120; Indels
                                                                                             331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34506.029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    #1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                    214
```

ADDRESSEE:

```
γ
                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              맑
                                                                                                                                                                                   RESULT 9
US-08-222-617A-4
                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                  Sequence 4, Application US/08222617A Patent No. 5882879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEFAX: 608-831-2106
INFORMATION FOR SEQ ID NO: 6:
                                                                                APPLICANT:
APPLICANT:
                                                APPLICANT: APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REGISTRATION NUMBER: 30,492
REFERENCE/DOCKET NUMBER: 34
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: PatentIn Release #1.0, Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                 APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                         218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            109
                                                                                                                                                                                                                                                      318
                                                                                                                                                                                                                                                                                       274 ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                        266
                                                                                                                                                                                                                                                                                                                                                                                         216 ACVRFSHARDPIFGNQ---IIPDTAILSVVPFHHGFGMFTTLGYLIC-----GFRVVL--
                                                                                                                                                                                                                                                                                                                                                                                                                     162 VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                           164 SMYTFVTSHLPPGFNEYDFV----PESF----DRDKTIALIMNSSGSTGLPKGVALPHRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            104 APANDIYNERELLNSMGISQPTVVFVSKKGLQKILNVQKKLPIIQKIIIMDSKTDYQGFQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity
nes 74; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              48 IEVDITYAEYFEMSVRLAEAMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIG-VAV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: US/0 FILING DATE: 12-DEC-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                                                                                                                                                                                                                                                      APLSKEVGEAVAKRF
                                                                                                                                                                                                                                                                                                                                                        PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS
                                                                                                                                                                                                                                                                                                                      ----MYRFEEELFLRSLQDYKIQSALLVPTL-FSFFAKSTLIDKY---DLSNLHEIASGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      53717-1914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sara, Charles S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Madison
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ΨH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 550 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8000
                                                                                Martin, Juan F. Garcia, Bruno D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10.9%; Score 168; DB 1; Length 550; ilarity 23.5%; Pred. No. 1.9e-09; Conservative 53; Mismatches 120; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                              Gutierrez,
Van Liempt, Henk
               Von Doehren, Hans
Palissa, Harriet
                                                  Barredo,
                                                                                                                 Veenstra, Annemarie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  608-831-2100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DeWitt Ross & Stevens, S.C. 00 Excelsior Drive, Suite 401
                                                  Jose L.
                                                                Santiago
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US/08/354,240A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30,492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34506.029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                        273
                                                                                                                                                                                                                                                                                                                                                                                                                                                           215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               67
                                                                                                                                                                                                                                                                                                                        317
                                                                                                                                                                                                                                                                                                                                                                                         265
                                                                                                                                                                                                                                                                                                                                                                                                                        217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                17;
```

```
Qy
                                                                                                 US-08-222-617A-13
                                                                                                                                                                                 B
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; OTHER INFORMATION: ; OTHER INFORMATION: US-08-222-617A-4
                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
Sequence 13, Application US/08222617A
Patent No. 5882879
GENERAL INFORMATION:
APPLICANT: Veenstra, Annemarie E.
APPLICANT: Martin, Juan F.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER: INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: US/08 FILING DATE: 04-APR-1994 CLASSIFICATION: 435 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                 2719 FA 2720
                                                                                                                                                                                                                                                                                                                                          2615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES: 2
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Montenegro, Eduardo P.
TITLE OF INVENTION: A Method for Influencing Beta-Lactam
TITLE OF INVENTION: Antibiotic Production and for Isolation of Large
TITLE OF INVENTION: Quantities of ACV Synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                       2555 XVVLDSPETLACLNQQSKENPTTSTQKPSDLAYVIFTSGTTGKPKGVLVEHQSVVQLRNS 2614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2450 DRIAIADGTRSLSYSELNERANQLVHLTISSASIVADDRIALLLDKSIDMVIALLAVWKA 2509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                            2669 DIGRREKLSYLSGTPSVLQQIELSR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOLECULE TYPE:
                                                                                                                                                                                                                       289
                                                                                                                                                                                                                                                                                                                                                                                                                                           120 LLDLDAPN-----GYTFKEDEYPST------AYLQYTSGSTRTPAGVVMSHQNVRVNFEQ 168
: ||:| ||:| ||:| ||:|
                                                                                                                                                                                                                                                                                                                                                                              169 LMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARW 228
                                                                                                                                                                                                                                                                                               229 MHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADR 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     60 GRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVD 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7 DGVAI-----TLTRSQLYRRTLNVAQELSRCGS--TGDRVVISAPQGLEYVVAYLGALQA 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAAYVPLDPT---YPSQRTELILEESSARTLITTR-----KHTPR-----GGTVANVP 2554
                                                                                                                                                                                                                       FA 290
                                                                                                                                                                                                                                                                                                                                       LIERYFGETNG----SHAVLFLSNYVFDFSLE-QLCLSVLGGNKLII-PPEEGLTHEAFY 2668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Chicago
: Illinois
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3712 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300 South Wacker Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Modified-site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IBM PC compatible SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            McDonnell Boehnen Hulbert & Berghoff
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "Xaa-Ala
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US/08/222,617A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 161.5; DB 2
Pred. No. 2.1e-07;
5; Mismatches 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or
                                                                                                                                                                                                                                                            -- LPHLHMVTAAGEEFHASQFEKIIRSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 3712;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                            2718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11;
```

δÃ

289

FΑ

290

```
Q
                                                                                                                                           밁
                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                      ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; OTHER INFORMATION:
; OTHER INFORMATION:
; OTHER INFORMATION:
US-08-222-617A-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          uery Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE/DOCKET NUMBER: INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Montenegratifle of INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                         2510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HYPOTHETICAL: NC ANTI-SENSE: NO ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2450 DRIAIADGTRSLSYSELNERANQLVHLIISSASIVADDRIALLLDKSIDMVIALLAVWKA 2509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION DATA:
APPLICATION NUMBER: US,
FILING DATE: 04-APR-19
2669 DIGRREKLSYLSGTPSVLQQIELSR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STREET: STREET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                             120 LLDLDAPN-----GYTFKEDEYPST-----AYLQYTSGSTRTPAGVVMSHQNVRVNFEQ 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60 GRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVD 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY: Protein LOCATION: 1..3665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7 DGVAI-----TLTRSQLYRRTLNVAQELSRCGS--TGDRVVISAPQGLEYVVAYLGALQA 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORGANISM: Acremonium chrysogenum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ENGTH:
                                                               MHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADR
                                                                                                                                                                                                                                                                                      : ||:|
SVYLDSPETLACINQQSKENPTTSTQKPSDLAYVIFTSGTTGKPKGVLVEHQSVVQLRNS 2614
                                                                                                                                                                                                                                                                                                                                                                                                                                     GAAYVPLDPT---YPSQRTELILEESSARTLITTR-----KHTPR-----GGTVANVP 2554
                                                                                                                                           |: || :|:|
LIERYFGETNG
                                                                                                                                                                                                              LMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARW 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Illinois
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3665 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300 South Wacker Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Montenegro, Eduardo P./EDITION: A Method for Influencing Beta-Lactam
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Van Liempt, Henk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Palissa, Harriet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Barredo, Jose L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gutierrez, Santiago
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          : protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     McDonnell Boehnen Hulbert & Berghoff
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          04-APR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Doehren, Hans
                                                                                                                                           -SHAVLFLSNYVFDFSLE-QLCLSVLGGNKLII-PPEEGLTHEAFY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bruno D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Quantities of ACV Synthetase 27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10.4%; Score 160.5; DB 1
22.8%; Pred. No. 2.6e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Antibiotic Production and for Isolation of Large
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /label= ACVS
/note= "ACV Synthetase from Acremonium
chrysogenum; aa 1-3665"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US/08/222,617A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            97,157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
--LPHLHMVTAAGEEFHASQFEKMRSQ 2718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 3665;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                           2668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11;
```

```
В
                                                                                                              ρy
                                                                                                                                                     В
                                                                                                                                                                                         Q
                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                          ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-222-617A-25

; Sequence 25, Application US/08222617A

; Patent No. 5882879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-08-222-617A-25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
Matches 69; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE/DOCKET NUMBER: 9
INFORMATION FOR SEQ ID NO: 25:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                2510
                                                                                                                                                                                                                                                                                                         2450 DRIAIADGTRSLSYSELNERANQLYHLIISSASIVADDRIALLLDKSIDMVIALLAVWKA 2509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY: li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2719 FA
2669 DIGRREKLSYLSGTPSVLQQIELSR------LPHLHMVTAAGEEFHASQFEKMRSQ 2718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ZIP: 60606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CITY: Chicago
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/08/222,617A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENGTH:
                                                                                                                                                                                                                                                                                                                                            7 DGVAI-----TLTRSQLYRRTLNVAQELSRCGS--TGDRVVISAPQGLEYVVAYLGALQA 59
                                                                        LIERYFGETNG----SHAVLFLSNYVFDFSLE-QLCLSVLGGNKLII-PPEEGLTHEAFY 2668
                                                                                                          LMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARW 228
                                                                                                                                                     SVVLDSPETLACLNQQSKENPTTSTQKPSDLAYVIFTSGTTGKPKGVLVEHQSVVQLRNS 2614
                                                                                                                                                                                         LLDLDAPN-----GYTFKEDEYPST-----AYLQYTSGSTRTPAGVVMSHQNVRVNFEQ 168
                                                                                                                                                                                                                                GAAYVPLDPT---YPSQRTELILEESSARTLITTR-----KHTPR-----GGTVANVP 2554
                                                                                                                                                                                                                                                                 GRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVD 119
                                     MHLMASDFHAFSAAPNFAFELAARRTTODDMAGRDLGNILTILSGSERVQAATIKRFADR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Illinois
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3712 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              E: McDonnell Boehnen Hulbert & Berghoff
300 South Wacker Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Van Liempt, Henk
Montenegro, Eduardo P.
MONTENTION: A Method for Influencing Beta-Lactam
IVENTION: Antibiotic Production and for Isolati
IVENTION: Quantities of ACV Synthetase
SEQUENCES: 27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Palissa, Harriet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Von Doehren, Hans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Martin,
                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gutierrez, Santiago
Barredo, Jose L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Garcia, Bruno D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Veenstra, Annemarie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   04-APR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Juan F
                                                                                                                                                                                                                                                                                                                                                                                10.4%; Score 160.5; DB 2; 22.8%; Pred. No. 2.7e-07; tive 55; Mismatches 129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Version
                                                                                                                                                                                                                                                                                                                                                                                                                     Length 3712;
                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Isolation
                                                                                                                                                                                                                                                                                                                                                                                    49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of.
                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Large
                                       288
                                                                                                                                                                                                                                                                                                                                                                                    11;
```

QΥ

289

FΑ

Ъ

2719 FA

2720

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; TYPE: PRT ; ORGANISM: Sorangium cellulosum US-09-335-409-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-335-409-3
                                                                                                                                                                                                                                                                                                           US-08-222-617A-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: PatentIn Ver. 2.0 SEQ ID NO 3
                                                                                                                                                                                                                                                                     Patent No.
                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 3, Application US/09335409 Patent No. 6121029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Cyr, Devon
APPLICANT: Goerlach, Joern
TITLE OF INVENTION: GENES FOR THE BIOSYNTHESIS
FILE REFERENCE: 4-30582A
CURRENT APPLICATION NUMBER: US/09/335,409
CURRENT FILING DATE: 1999-06-17
NUMBER OF SEQ ID NOS: 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Schupp, Thomas
APPLICANT: Ligon, James
APPLICANT: Molnar, Istvan
APPLICANT: Zirkle, Ross
                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                APPLICANT: Van Liemp
APPLICANT: Montenegr
TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 1410
                                                                                                                                                                     APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                  APPLICANT:
APPLICANT:
                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      548
                                                                                                                                                                                                                                                                                                                                                                                      752 LIEREKVTVWNSVPALMRMLVEHFEGRPDSLARSLR--LSLLSG 793
                                                                                                                                                                                                                                                                                                                                                                                                                          231 LMASD-FHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSG 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         605 ADLPAERIHYLL-DHGEVKLVLTQPWLDGKLSWPPGIQRLLVSEAGVEGDGDQPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local Similarity nes 72; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12 TLTRSQLYRRTLNVAQELSRCGSTGDRVV-ISAPQGLEYVVAYLGALQAGRIAVPLSVPQ 70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -MMPIQTPS-----DLAYVIYTSGSTGLPKGVMIDHRGAVNTILDINERFE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGVTDERSDSVLSDSSPVAILTTSSAVDD------VVQHVARRPGESPPSIIEV 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TLTYEELSRRSRRLGARLREQGARPNTLVAVVMEKGWEQVVAVLAVLESGAAYVPI---D 604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GYFADTDGIPPPNSAL-VSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQ-----NVRVNFEQLMS
                                                                                                                                                                                                                                                                       8, Application US/08222617A
o. 5882879
  SEQUENCES:
Van Liempt, Henk
Montenegro, Eduardo P.
Montenegro, Eduardo P.
VENTION: A Method for Influencing Beta-Lactam
VENTION: Antibiotic Production and for Isolat
VENTION: Quantities of ACV Synthetase
EQUENCES: 27
                                                                                                            Barredo, Jose L.
Von Doehren, Hans
Palissa, Harriet
                                                                                                                                                                                       Martin, Juan F. Garcia, Bruno D.
                                                                                                                                                                       Gutierrez, Santiago
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                 Veenstra,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -IGPGDRVLALSSLSFDLSVYDVFGILA--AGG--TIVVPDASKLRDPAHWAE 751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.4%;
                                                                                                                                                                                                                               Annemarie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 144; DB 3; Pred. No. 3.3e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches 111;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 3; Length 1410;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OF EPOTHILONES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                    Isolation of Large
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13;
```

```
QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                  US-08-471-119A-2
                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                            뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-222-617A-8
                                                                                                                                Patent No. 5827706
                                                                                                                                                  Sequence 2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE/DOCKET NUMBER: INFORMATION FOR SEQ ID NO: 8:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECCE: NO
            TITLE OF INVENTION: NUMBER OF SEQUENCES:
                                              APPLICANT: Leitner, Ernst
APPLICANT: Schneider, Elis
APPLICANT: Schoergendorfe
APPLICANT: Weber, Gerhard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ANTI-SENSE: NO ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE: 04-APR-1994 CLASSIFICATION: 435 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: PatentIn Release #1.0, Version CURRENT APPLICATION DATA:
CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                        293
                                                                                                                                                                                                                                                                                                          258
                                                                                                                                                                                                                                                                                                                                          233
                                                                                                                                                                                                                                                                                                                                                                            206
                                                                                                                                                                                                                                                                                                                                                                                                                                                151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  119
                                                                                                                                                                                                                                      308 N 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  102 GAYVPIDIEYPR-----DRIQYILQDSQTKIVLTQKS-VSQLV-HDVGYSGE----VVVL 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: FILING DATE: 04-AP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      42 DRVAIVFENRRLSYQELNRKANQLARALLEKGVQTDSIVGVMMEKSIENVIAILAVLKAG 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: amino acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7 DGVAIT-----LTRSQLYRRTLNVAQELSRCGSTGDRVV-ISAPQGLEYVVAYLGALQAG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RIAVPLSV--PQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEV 118
                                                                                                                                                                                                                                                                        z
                                                                                                                                                                                                                                                                                                                                                                                                        DTDGIPPPNSALVSWLP---FYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARWMHLM 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                DLLDLDAPNGYTFKEDEYPS-TAYLQYTSGSTRTPAGVVMSHQNVRV--NFEQLMSGYFA 175
                                                                                                                                                                                                                                                                                                          ENELTITLPPTYLTHLTPERIT - - -
                                                                                                                                                                                                                                                                                                                                          ASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADRFARF 292
                                                                                                                                                                                                                                                                                                                                                                          ----LASPSKTGSGFLPACRSTHPFGKCSWLCCLA----PRVHPSKQTIHDFAAFEHYLS
                                                                                                                                                                                                                                                                                                                                                                                                                                              DEEQLDARETANLHQPSKPTDLAYVIYTSGTTGKPKGTMLEHKGIAICNPFSKIR-----
                                                                                                                                                                                                                                                                      293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Chicago
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Illinois
                                                                                                                                                  Application US/08471119A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          798 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            300 South Wacker
                                          Schneider, Elisabeth
Schoergendorfer, Kurt
Weber, Gerhard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacillus brevis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        McDonnell Boehnen Hulbert & Berghoff
O South Wacker Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9.3%;
                              Cyclosporin Synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/08/222,617A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97,157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 143; DB 2;
Pred. No. 1.7e-06;
1; Mismatches 134
                                                                                                                                                                                                                                                                                                          SLRIMITAGSASSAPLVNKWKDKLRYI 307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      134; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 798;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                205
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; ORGANISM: Tolypocladium niveum ; STRAIN: ATCC 34921 US-08-471-119A-2
                                                                                                                                                                                                                                                                                                                                          US-08-510-646B-33
                                                                                                                                                                                                                                                                          Patent No. 6077699
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                     Sequence 33,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches 46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: KASSENOFF, Melvyn
REGISTRATION NUMBER: 26,389
REFERENCE/DOCKET NUMBER: 100-
TELECOMMUNICATION INFORMATION:
TELEFAX: 201 503 8474
TELEFAX: 201 503 8407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEFAX: 201 503 2000; INFORMATION FOR SEQ ID NO: 2: SEQUENCE CHARACTERISTICS: SEQUENCE CHARACTERISTICS: 15281 amino acids
                                APPLICANT: De Crecy-Lagard, Valerie
TITLE OF INVENTION: Biosynthesis Of Streptogramins, Nucleotide Sequences
TITLE OF INVENTION: Coding For These Polypeptides And Their Use
                                                                                                                  APPLICANT:
                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4570 DSIALIHGSEKLSYAQLDRESDRVARWLRHRSFSSDTLIAVLAPRSCETTIAFLGILKAN 4629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: F10ppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/471,119A
FILING DATE: 06-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                     4674 DFVPIRDTFTTLTDGTLQDGPTIERPSAQSLAYAMFTSGSTGRPKGVMVQHRNI 4727
                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HYPOTHETICAL:
ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MOLECULE TYPE:
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4630 LAYLPLDVKAPAA---RIDAIVSSLPGNKLILLGANV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61 RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIE--- 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE: No. 5827706artis Corporation STREET: 59 Route 10 CITY: East Hanover STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7 DGVAI----TLTRSQLYRRTLNVAQEL-SRCGSTGDRVVISAPQGLEYVVAYLGALQAG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         07936

    Application US/08510646B
6077699

                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----VDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQNV 162
                                                                                                                                   Thibaut, Denis
Zagorec, Monique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                  Debussche, Laurent
                                                                                                                                                                                                Jacques,
                                                                                                                                                                                                                   Crouzet,
                                                                                                                                                                                                                                     Blanche, Francis
                                                                                                                                                                            Lacroix,
                                                                                                                                                                                                                                                              Blanc,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   single
                                                                                                                                                                                                                                                          Veronique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9.0%; Score 139; DB 2; 26.4%; Pred. No. 0.00052;
                                                                                                                                                                                                                       Joel
                                                                                                                                                                              Patricia
                                                                                                                                                                                                Nathalie
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             100-8029/CONT/CONT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 2; Length 15281;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 34; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----TPPKLQEAAI 4673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         رى
د.
```

Search completed: January Job time: 225 sec

> ر. د

```
Qy
                                                                                                               Qy
                                                                             Db
                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                  ; TOPOLOGY: US-08-510-646B-33
                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: (202) 408-44 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NAME: Meyers, Kenneth J.
REGISTRATION NUMBER: 25,146
REFERENCE/DOCKET NUMBER: 0.8
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: FR 92/11441
FILING DATE: 25-SEP-1992
ATTORNEY/AGENT INFORMATION:
NAME: Meyers, Kenneth J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: PCT/FR 93/00923 FILING DATE: 25-SEP-1993 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08
FILING DATE: 10-MAY-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: Patentin Relacional APPLICATION NUMBER: US.
                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION DATA:
                                    121 LDLDAPNGYTFKEDE-----YP-STAYLQYTSGSTRTPAGVVMSHQNV 162
                                                                             583 AAYLPV---DPAYPAERIAYLLQDGAPALVLTHTSV-----AAGLPGGVPQLL;; VDQ 630
                                                                                                                                                        523 DAVALVQEGTETGYADLNTRANKLARLLRAQGIGPEQVVALSLPRSADLIVSVLAVLKTG 582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC
OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILING DATE: 0:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE: Finnegan, Henderson, Farabow, Garrett & Dunner STREET: 1300 I Street, N.W., Suite 700 CITY: Washington
                                                                                                                 61 RIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVDL 120
                                                                                                                                                                                                                                                                                                                                                                      STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEPHONE:
                                                                                                                                                                              7 DGVAITLIRSQ-----LYRRTLNVAQELSRCGSTGDRVV-ISAPQGLEYVVAYLGALQAG 60
                                                                                                                                                                                                                                                                                                                                                                                         LENGTH: 739 amino acids TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COUNTRY: USA
VGLDDVPGHDLTDAERTTPLHPLHPAYVIYTSGSTGLPKGVPVPHRSV 678
                                                                                                                                                                                                                                   49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20005-3315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D.C
                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IBM PC compatible SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (202)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          03-AUG-1995
                                                                                                                                                                                                                                                                                                                                                                      single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      408-4400
                                                                                                                                                                                                                                                 8.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US 08/403,852
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US/08/510,646B
                                                                                                                                                                                                                                   28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 03806.0054-01000
                                                                                                                                                                                                                                   Score 129; DB 3; 1
Pred. No. 4.7e-05;
18; Mismatches 67;
                                                                                                                                                                                                                                                                     Length 739;
                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                   24;
                                                                                                                                                                                                                                 Gaps
```

GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd

١,

```
Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OM protein - protein search, using sw model
                                                                                                                                                                                                                         N<sub>O</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 al number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              on:
                                                                                                                                                                                                                                                                                                      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ..
                                                                                                                                                                                                                         Score
 170
170
170
169
168
168
168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  seq length: 0
seq length: 2000000000
                                                                                                                                                                                                                         Match
                                                                                                                                                                                                                                                                                                                                                                               9:
10:
11:
12:
13:
14:
15:
16:
17:
18:
19:
                                                                                                                                                                                                                                             Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-461-774-6
1540
1 DYEQDWDGVAITLT
11.0
11.0
11.0
11.0
11.0
10.9
10.9
10.9
                                                                                                                                                                                                                                                                                                                                                                  // SIDS1/gcgdata/geneseq/geneseqp/AA1985.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1986.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1986.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1987.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1989.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1989.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1991.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1991.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1992.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1994.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1996.DAT: *
// SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       January 5, 2001, 14:26:37; Search time 62.98 Seconds (without alignments) 162.879 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A_Geneseq_36:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    268485 seqs, 34193795 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DYEQDWDGVAITLTRSQLYR.....TIKRFADRFARFNLQERVKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /SIDS1/gcgdata/geneseq/geneseqp/AA1980.DAT:*
/SIDS1/gcgdata/geneseq/geneseqp/AA1981.DAT:*
/SIDS1/gcgdata/geneseq/geneseqp/AA1982.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /SIDS1/gcgdata/geneseq/geneseqp/AA1983.DAT:*
/SIDS1/gcgdata/geneseq/geneseqp/AA1984.DAT:*
                                                                                                                                                                                                                         Length
DΒ
 20
15
16
17
18
18
13
                                                                                                                                       16
                                                                                                                                                                                                                         B
                              R98518
R86627
R50011
R83006
Y08523
R54867
R72801
R72801
R98515
R98515
                                                                                                                                                                                                                                                                           SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    268485
                            Vaccinia virus vec
P. pyralis variant
Modified firefly l
Modified firefly l
                                                                                                                                                                                                                      Description
                                                                                                                                                    Firefly
Firefly
                                                                                                   P. pyralis pTetLuc
Hepatitis C Virus
                                                                                                                                                                                       P. pyralis variant
              Lux::npt-II
                                                                                                                                       Firefly
                                                                                                                                                     luciferase
luciferase
                                                                                                                                       luciferase
                 fusion
```

	R3471	14	3587	8.2	126
gene	R2396	13	669	8.3	28.
facA gene produc	R2396	13	669	8.3	•
Amino acid sequenc	Y1494	20	643		13
Amino acid sequenc	Y1494	20	643	8.4	130
B.diminuta	W9945	20	525		ω
Omega-cyclc	W7163	19	552		30.
Mutant luciferase	Y0685	20	546		2
Neisseria n	Y7460	21	517	٠	32.
Mutant'luci	Y0685	20	546	•	33.
Aspen 4-coumara	Y0609	20	535		134
Bacillus su	R3471	14	3588	٠	134.5
Maize 4-coumarate:	Y0565	20	575	8.7	134.5
Mutant luciferas	Y0685	20	546	8.7	134.5
Mutant luciferas	Y0685	20	546	8.7	134.5
Mutant luciferase	Y0685	20	546		134.5
æ	Y7460	21	517		134.5
	R3471	14	1274		135
Mutant luciferase	0 Y06851	20	546		135
Beetle luc	R7656	16	543		136
	W9771	20	403		136.5
Mutant luciferase	Y0686	20	544		137
ant	Y0686	20	544		137
<	R4492	15	15281		139
t.	Y0685	20	546		142.5
Mutant luciferase	Y0685	20	546		143.5
Mutant luc	Y0685	20	546		143.5
g.	Y5857	21	1410		144
	Y0685	20	546		144.5
t luc	Y0686	20	545		146.5
1 د	R5392	15	563		150
s	R4022	14	3639	10.4	160.5
מכיי שייוניופנס			41.1		1

ALIGNMENTS

RESULT R98518

R98518 standard; Protein; 550

AA.

11-MAR-1997

(first entry)

pyralis variant luciferase E270K/E354K.

R98518;

```
WPI; 1996-354533/35
                Lowe CR,
                                        24-APR-1995;
20-JAN-1995;
                                                                                                   Misc-difference
                                                                                                           Location/Qualifiers Misc-difference 270
                                                                                                                               Photinus pyralis.
                                                                                                                                           Luciferase;
                            (MINA ) UK SEC
                                                          19-JAN-1996;
                                                                      25-JUL-1996.
                                                                                  W09622376-A1
                Murray JA,
                                                                                                                                          firefly; ATP; heat stability; luciferin; light
                            FOR DEFENCE
                                        95GB-0008301
95GB-0001172
                                                          96WO-GB00099
                                                                                             /label= E354K
                                                                                                        /label= E270K
                Squirrell
                Ď,
                White
                J,
```

```
뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                         627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tches
                                                                                                                                Misc-difference
                                                                                                                                                                              Synthetic.
                                                                                                                                                                                                                                                                          Firefly luciferase (A215L,E354X) engineered mutant
                     W09525798-A1.
                                                                                                                                                                                                            Photinus pyralis; luc gene; ATP analysis.
                                                                                                                                                                                                                              Luciferase; thermostability; enzyme stabilization; Photinus pyralis; luc gene; site-directed mutagenes
                                                                                                                                                                                                                                                                                                          12-FEB-1996 (first entry)
                                                                                                                                                                                                                                                                                                                                                                       R86627 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This sequence represents a variant luciferase from the firefly, P. pyralis. In this sequence the amino acid at position 270 has been mutated such that it is not Glu. Also the amino acid at position 354 has been mutated so that it is not Glu. This luciferase has a lower Km for the substrate ATP than native luciferase. This luciferase therefore has a greater heat stability than wild-type luciferase. The luciferase may be used in an assay to measure ATP with luciferin, whereby the amount of light is related to the amount
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mutant luciferase(s) with greater heat stability than wild-types useful in luminescent reagents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                       317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATP present.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            acvrfshardpifgng---ilpdtailsvvpfhhgfgmfttlgylic----gfrvvl--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav--- 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                      aplskevgeavakrf 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     apandiynerellnsmnisqptvvfvskkglqkilnvqkklpiiqkiiimdsktdyqgfq 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----myrfekelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   550 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                Location/Qualifiers 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26-29; 39pp; English.
                                                                                                                 /note=
                                                                                                                                                                                                                                                                                                                                                                        Protein; 550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11.2%;
                                               "amino acid at position 354 is any amino other than Glu, pref. also not Gly, Pro or Asp, and is pref. Trp, Val, Leu, Ile, Asn or esp. Arg or Lys, their analogues or modified forms"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 172; DB 17; Pred. No. 4.9e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches 118;
                                                                                                                                                                                                                            mutagenesis; label;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                             firefly;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    68;
                                                                                                                acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  17;
```

ć

Photinus pyralis

```
RESULT
R50011
ID R5
Q
                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                   ρy
                                                                                                                                                                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                               Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A doubly mutated luciferase of Photinus pyralis has leucine at amino acid position 215 and an amino acid other than glutamic acid at position 354. The luciferase, obtd. by site-directed mutagenesis of the luc gene, shows improved thermostability compared to the wild-type.
                                                             Multicistronic expression unit; bicistronic vector system;
                                                                                     Firefly luciferase
                                                                                                                                                                    R50011 standard; Protein;
                                                                                                                  29-SEP-1994
                                                                                                                                            R50011;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New heat stable luciferase mutransformed cells, useful as determn of ATP
                                    firefly.
                                                 recombinant protein production;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Disclosure; Page 23-25; 40pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1995-344619/44.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Lowe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20-JAN-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         22-MAR-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  28-SEP-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (MINA ) UK SEC FOR DEFENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23-MAR-1994;
                                                                                                                                                                                                                                      317
                                                                                                                                                                                                                                                                                        265
                                                                                                                                                                                                                                                                                                                  218
                                                                                                                                                                                                                                                                                                                                            215
                                                                                                                                                                                                                                                                                                                                                                      162
                                                                                                                                                                                                                                                                                                                                                                                              163
                                                                                                                                                                                                                                                                                                                                                                                                                        109
                                                                                                                                                                                                                                                                                                                                                                                                                                               103
                                                                                                                                                                                                                                                              274 ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity hes 74; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9 VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67,
                                                                                                                                                                                                                                   aplskevgeavakrf 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CR,
                                                                                                                                                                                                                                                                                                                                           lcvrfshardpifgng---iipdtailsvvpfhhgfgmfttlgylic----gfrvvl--
                                                                                                                                                                                                                                                                                                                                                                  VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                             smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt 214
                                                                                                                                                                                                                                                                                                                                                                                                                                               apandiynerellnsmnisqptvvfvskkglqkilnvqkklpiiqkilimdsktdyqgfq 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP------ 108
                                                                                                                                                                                                                                                                                       ----myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                                                                                                                                                                                                                               PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                     -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalf1g-vav--- 10 \mu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Murray JAH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    550 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  95GB-0001170
94GB-0005750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        95WO-GB00629
                                                                                       reporter protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11.1%;
23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Squirrel
                                                                                                                                                                    550 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               mutants - related DNA, vectors as reporter genes, assay labels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 171; DB 16;
Pred. No. 6.2e-09;
                                                 reporter protein; luciferase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ď,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                White
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ЪJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                  273
                                                                                                                                                                                                                                                                                                                                            264
                                                                                                                                                                                                                                                                                                                                                                    217
```

ħ.

```
RESULT
R83006
ID R8
XX
AC R8
XX
DT 12
DT 12
CX
DE F1
XX
KW Lu
KW Ph
                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              x
x
x
y
y
y
x
x
x
x
                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                         δã
                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
Matches 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Reporter genes coding for secretory alkaline phosphatase (Q58731) and for luciferase (Q58732) can be co-expressed using a bicistronic system in which a sequence responsible for internal translation start (designated "IRES") is located between cistrons coding for
Luciferase; thermostability; enzyme stabilization; photinus pyralis; luc gene; site-directed mutagenes ATP analysis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI; 1994-101190/12
N-PSDB; Q58732.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (BEIE )
                                                                         12-FEB-1996
                                                                                                  R83006
                                                                                                                         R83006 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Example 1; Page 66-67; 109pp; German.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New multicistronic expression units - for producing amts. of polypeptide(s) in mammalian cells as hosts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Achterberg V, I
Meyer-Ingold W,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      17-MAR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      27-AUG-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              26-AUG-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              W09405785-A
                                                                                                                                                                                       317
                                                                                                                                                                                                              274
                                                                                                                                                                                                                                      265
                                                                                                                                                                                                                                                            218
                                                                                                                                                                                                                                                                                    215
                                                                                                                                                                                                                                                                                                           162
                                                                                                                                                                                                                                                                                                                                   163
                                                                                                                                                                                                                                                                                                                                                           109
                                                                                                                                                                                                                                                                                                                                                                                    103
                                                                                                                                                                                                                                                                                                                                                                                                                                 47
                                                                                                                                                                                                                                                                                                                                                                                                           89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match 11.0%;
Local Similarity 23.5%;
ses 74; Conservative 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   two proteins.
                                                                                                                                                                                   aplskevgeavakrf 331
                                                                                                                                                                                                                                                                                   acvrfshardpifgng---lipdtailsvvpfhhgfgmfttlgylic----gfrvvl--
                                                                                                                                                                                                                                                                                                                                               -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN
                                                                                                                                                                                                                                                                                                                                                                                 a pandiy nerelln s \verb|mnisq| ptvv fvskkglqkilnvqkklpliqkilimdsktdyqgfq
                                                                                                                                                                                                                                                                                                                                                                                                                               VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS
                                                                                                                                                                                                                                                           PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                          VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                 smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt
                                                                                                                                                                                                                                                                                                                                                                                                         VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BEIERSDORF AG.
                                               luciferase E354 engineered mutant.
                                                                                                                                                                                                             SERVQAATIKRF 285
                                                                                                                                                                                                                                    -myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              550 AA;
                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Dirks W, D
V, Mielke H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    92DE-4228458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              93WO-EP02294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BIOTECH
                                                                                                                         Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FORSCHUNG GMBH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dorschner A,
H, Wirth M,
                                                                                                                         550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 170; DB
Pred. No. 7.9e
54; Mismatches
            site-directed mutagenesis; label;
                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Doerschner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eichner W,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 15;
7.9e-09;
nes 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hauser
                         firefly;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                equimolar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Η;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                         161
                                                                                                                                                                                                                                                                                                                                                                                 162
                                                                                                                                                                                                                                                                                                                                                                                                                                 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                        67
                                                                                                                                                                                                                                     316
                                                                                                                                                                                                                                                                                                                                   214
                                                                                                                                                                                                                                                           273
                                                                                                                                                                                                                                                                                                           217
                                                                                                                                                                                                                                                                                                                                                                                                         108
                                                                                                                                                                                                                                                                                   264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  17;
```

RESULT Y08523

U

H

Y08523

standard;

Protein; 550

```
DЬ
                                                                                                                                                                      Ş
                                              Вþ
                                                                     Ωy
                                                                                               В
                                                                                                                     Qy
                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                 Novel luciferases are created by site-directed mutagenesis of the P. pyralis luc gene (see T05621) to create substitutions at amino acid position 354 (glutamate in the wild-type) of the encoded protein (R83006) that result in improved enzyme thermostability.
                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 7; Page 20-22; 40pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 New heat stable luciferase mutants - related DNA, vectors transformed cells, useful as reporter genes, assay labels
                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      determn of ATP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-PSDB; T05621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Lowe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20-JAN-1995;
23-MAR-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22-MAR-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    W09525798-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MINA ) UK SEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           28-SEP-1995
317
                                              265
                                                                      218
                                                                                               215
                                                                                                                                                 163
                                                                                                                                                                                                 103
                                                                                                                       162
                                                                                                                                                                         109
                                                                                                                                                                                                                                                 47
                                                                                                                                                                                                                        89
                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                     9 VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1995-344619/44
                                                                                                                                            smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt 214
                                                                                                                                                                                                                                              ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav---
                                              ----myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                      PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                            acvrfshardpifgng---iipdtailsvvpfhhgfgmfttlgylic----
                                                                                                                      VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                       -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                             apandiynerellnsmnisqptvvfvskkglqkilnvqkklpiiqkiiimdsktdyqgfq 162
                                                                                                                                                                                                                    VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP-------
                                                                                                                                                                                                                                                                                               74;
                     SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Murray JAH,
                                                                                                                                                                                                                                                                                                                                                            550
                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                            AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FOR DEFENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             95GB-0001170
94GB-0005750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   95WO-GB00629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note=
                                                                                                                                                                                                                                                                                                           11.0%; Score 170; DB 16; 23.5%; Pred. No. 7.9e-09;
331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Squirrel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acid other than Glu, pref. also not Gly pro or Asp, and is pref. Trp, Val. Leu, Ile, Asn or esp. Arg or Lys, their analogues or modified forms"
                                                                                                                                                                                                                                                                                               54;
                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           at position 354 is any amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             White
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Гd
                                                                                                                                                                                                                                                                                                 119;
                                                                                                                                                                                                                                                                                                                     Length 550;
                                                                                                                                                                                                                                                                                               Indels
                                                                                              -gfrvvl--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                               68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gly,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                        108
                                                                                                                                                                                                                                               102
                                              316
                                                                      273
                                                                                               264
                                                                                                                       217
                                                                                                                                                                                                                                                                        67
```

```
DЬ
 Вb
                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                       invention also describes a novel plasmid comprising either the luxCDBE genes, a tetracycline repressor (TetR) and a tetracycline promoter (TetA) from Tn10, or the insect luciferase gene, a tetracycline promoter (TetA) and a tetracycline promoter (TetA) and a tetracycline promoter (TetA) from Tn10. The tetracycline assay method can be used for the determination of tetracycline in a sample, e.g. to study the dosage and penetration of the medicine. The method can also be used to test cheese production, as cheese making bacteria are not able to work in the presence of tetracycline. The method can also be used to determine the presence or concentration of antibiotics in foodstuffs, e.g. for allergic people. The present assay method does not rely on the growth of microbes as do conventional tests, and so is much more rapid. The present assay is also more sensitive, as even a small amount of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (KARP/)
(KORP/)
(KURI/)
                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This invention describes a novel tetracycline assay that uses recombinant prokaryotic cells comprising a luciferase gene under the transcriptional control of a tetracycline repressor and tetracycline promoter and involves the detection of luminescence emitted form the cells. The assay
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tetracycline repressor;
insect; Tn10; medicine;
                                                                                                                                                                                                                                                                                                                                                   luminescence can be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      can be used to distinguish tetracycline form other microbial agents.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Example 2; Page 25-26; 67pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Assaying for tetracycline using recombinant prokaryotic cells
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Karp M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14-NOV-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11-NOV-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         27-MAY-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WO9925866-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Photinus pyralis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      allergy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Firefly; luciferase; tetracycline; transcriptional control; TetR; TetA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P. pyralis pTetLucI luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    03-AUG-1999 (first entry)
   163
                                        109
                                                                           103
                                                                                                              8
                                                                                                                                                 47
                                                                                                                                                                                                                                          Local
                                                                                                                                                                                      9
smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt
                                                                       apandiynerellnsmnisqptvvfvskkglqkilnvqkklpiiqkilimdsktdyqgfq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1999-338015/28
                                    -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                            VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP------
                                                                                                                                               ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav--- 102
                                                                                                                                                                                    VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KARP M.
KORPELA
KURITTU
                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Korpela M,
                                                                                                                                                                                                                                                                                                                    550 AA;
                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               97FI-0004235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98WO-FI00873
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲. ۲.
                                                                                                                                                                                                                                                                                                                                                         detected
                                                                                                                                                                                                                                          11.0%; Score 170; DB 20; 23.5%; Pred. No. 7.9e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kurittu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tetracycline promoter; luminescence; luminescence; luminescence; cheese production; antibiotic;
                                                                                                                                                                                                                         54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein
                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                           119;
                                                                                                                                                                                                                                                              Length 550;
                                                                                                                                                                                                                           Indels
                                                                                                              ----- 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       luxCDABE;
                                                                                                                                                                                                                       Gaps
                                                                         162
                                                                                                                                                                                                                           17;
```

4

٤

δ δ

Ş

Qy

SSSSS

```
RESULT R54867

R74867

R74867

R74867

R74867

R75867

                                                                                                        δÃ
  QУ
                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                              Matches
                                                                                                                                                                                          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                              fused to the firefly luciferase enzyme was constructed from PCR amplified fragments. The construct (which encodes the fusion protein sequence R54867) was useful for assaying the inhibitory activity of various antisense oligonucleotides on HCV gene translation; detection of luciferase activity provided a measure
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hepatitis C Virus; HCV; control; Non-A, non-B hepatitis virus; antisense; therapy; inhibition; viral protein precursor; recombinant vaccinia virus; HCV core protein gene; firefly;
                                                                                                                                                                                                                                                                                                                                                of expression of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   25-AUG-1992;
03-MAR-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chimeric Hepatitis C virus. Chimeric Photinus pyralis.
                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A recombinant vaccinia virus which codes for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Example 5; Page 244-250; 262pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Anti:sense oligo:nucleotide(s) complementary to the hepatitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Honda Y,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  23-AUG-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CA2104649-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R54867;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R54867 standard; Protein; 743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26-FEB-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hepatitis C Virus core protein-luciferase fusion protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21-DEC-1994
                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (SEKI/) SEKI M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     265
     8
                                                                                    VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1994-151836/19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aplskevgeavakrf 331
                                                    ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acvrfshardpifgng---iipdtailsvvpfhhgfgmfttlgylic---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---SERVQAATIKRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               genome
                                                                                                                                                              74;
                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q65322.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Seki M,
                                                                                                                                                                                                                                                                                               743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      reporter gene;
                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                               AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  are useful as antiviral agents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   92JP-0248796.
93JP-0042736.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  93CA-2104649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Yamada
                                                                                                                                                                                       11.0%;
23.5%;
                                                                                                                                                                                                                                                                                                                                                   HCV
                                                                                                                                                                                                                                                                                                                                                   core
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fusion construct.
                                                                                                                                                              54;
                                                                                                                                                                                       Score 170; DB 15;
Pred. No. 1.2e-08;
                                                                                                                                                                                                                                                                                                                                                protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AA
                                                                                                                                                              Mismatches
                                                                                                                                                                 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a HCV core
                                                                                                                                                                                                             Length 743;
                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -gfrvvl---
                                                                                                                                                                 68;
                                                                                                                                                              Gaps
                                                                                                             67
                                                            295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               217
                                                                                                                                                                 17;
```

1,

Ъ δõ В Qy В Qy Ъ Q 밁

```
Page 5
```

```
ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XXX ACC XX
   Query Match
Best Local S
Matches 74
                                                                                                                                                                                                                                                                                       086788 encodes R72800 Hepatitis C virus (HCV) T7N1-19, which disrupts viral gene translation, by preventing the binding of the viral mRNA to the internal ribozyme entry site. It was used in the construction of an antiviral agent detecting vector (086799 which encodes R72801), which comprises a vaccinia virus vector, a vector containing T7N1-19 and a firefly luciferase gene. The antiviral agent can be used to treat HCV, poliovirus, cerebral cardio-hepatitis, human rhinovirus and foot and mouth disease vira
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Antiviral agent comprising component which disrupts viral gene translation - used for the selective inhibition of e.g. Hepatic Virus, polio:virus and human rhinovirus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Disclosure;
                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (MITU ) MITSUBISHI KASEI CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       02-SEP-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 02-SEP-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14-MAR-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JP07069899-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          antiviral agent; poliovirus; human rhinovirus;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Vaccina virus vector; firefly luciferase; hepatitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Vaccinia virus vector comprising HCV T7N1-19 and firefly luciferase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                04-DEC-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R72801 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    foot and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       internal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           296
   Local Similarity
nes 74; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acvrfshardpifgnq---iipdtailsvvpfhhgfgmfttlgylic----gfrvvl--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aplskevgeavakrf 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    smytfvtshlppgfneydfv----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                apandiynerellnsmnisqptvvfvskkglqkilnvqkklpiiqkiiimdsktdyqgfq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q86799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ribozyme entry site; non-A non-B; cerebral cardio-hepatitis; mouth disease, % \left\{ 1,2,\ldots \right\}
                                                                                                                                                                                      743 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pages 19-22; 23pp; Japanese
   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       93JP-0241973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 93JP-0241973
                                  11.0%;
23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                743
54;
Score 170; DB 16;
Pred. No. 1.2e-08;
4; Mismatches 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -pesf----drdktialimnssgstglpkgvalphrt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ΑA
                                                                     Length
   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             e.g. Hepatitis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C virus; T7N1-19,
                                                                         743;
68;
Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    355
17;
```

δÃ

9

VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67

```
RESULT
R98515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Db
          luctiferase therefore has a greater heat stability than wild type luciferase. The luciferase may be used in an assay to measure ATP with luciferin, whereby the amount of light is related to the amount of ATP present.
                                                                                                                                                                                             WPI; 1996-354533/35
                                                                                                                                                                                                                                                                     24-APR-1995;
20-JAN-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Luciferase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R98515 standard;
                                                                                                                       Claim
                                                                                                                                                                                 N-PSDB;
                                                                                                                                                                                                                      Lowe CR,
                                                                                                                                                                                                                                             (MINA ) UK SEC
                                                                                                                                                                                                                                                                                                        19-JAN-1996;
                                                                                                                                                                                                                                                                                                                                  25-JUL-1996.
                                                                                                                                                                                                                                                                                                                                                         W09622376-A1
                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                            Photinus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P. pyralis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11-MAR-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R98515
                                                       This sequence represents a variant luciferase from the firefly, pyralis. In this sequence the amino acid at position 270 has been mutated such that it is not Glu. The luciferase has a lower Km for the substrate ATP than native luciferase. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                510 aplskevgeavakrf 524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a pandiy nerelln {\tt smnisq} ptvv fv {\tt skkglqkilnvqkklpiiqkiiimdsktdyqgfq}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acvrfshardpifgng---iipdtailsvvpfhhgfgmfttlgylic--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----myrfeeelflrslqdykiqsallvptl-fsffakstlidky----dlsnlheiasgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt
                                                                                                                      9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----GESPPSITEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                             luciferase(s) with greater heat stability than wild-types
in luminescent reagents
                                                                                                                                                                                  T36492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            <del>:-</del>
::
:-
                                                                                                                      Page 20-24; 39pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                            pyralis
                                                                                                                                                                                                                   Murray
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             variant luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     firefly;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                             FOR DEFENCE
                                                                                                                                                                                                                                                                    95GB-0008301
95GB-0001172
                                                                                                                                                                                                                                                                                                         96WO-GB00099
                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers 270
                                                                                                                                                                                                                                                                                                                                                                                 /note=
                                                                                                                                                                                                                     JA,
                                                                                                                                                                                                                                                                                                                                                                                             'label= E270x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            :: :: : - - : - : : : : :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATP; heat stability;
                                                                                                                                                                                                                   Squirrell
                                                                                                                                                                                                                                                                                                                                                                                 "Mutated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             E270X
                                                                                                                                                                                                                      Д,
                                                                                                                                                                                                                                                                                                                                                                                ţ
                                                                                                                                                                                                                                                                                                                                                                                improve
                                                                                                                                                                                                                      White
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     luciferin; light
                                                                                                                                                                                                                      PJ;
                                                                                                                                                                                                                                                                                                                                                                                heat stability'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        108
```

S

Sequence

550

B

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                      Misc-difference
                                                                                                                                                                         /note= "wild Misc-difference 548
                                                                                                                                                                                                                                                    Synthetic.
             (PROM-) PROMEGA CORP
                                                                                                    US5670356-A
                                                                                                                                                                                                                                                                                                    Firefly; luciferase; mutant; reporter gene; cell culture; transgenic plant; transgenic animal; cell free expression system; peroxisomal translocation sequence; cytoplasmic form; luc+; restriction site; genetic regulatory site; N-glycosylation site;
                                                                                                                                                                                                                                                                                                                                                                                                        W32936
                                                        12-DEC-1994;
                                                                               23-SEP-1997.
                                                                                                                                                                                                                                                                                                                                                                                                                             W32936 standard;
                                   12-DEC-1994;
                                                                                                                                                          Misc-difference
                                                                                                                                                                                                    Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                   22-JAN-1998
                                                                                                                                                                                                                          Misc-difference
                                                                                                                                                                                                                                                                                           post-translational modification.
                                                                                                                                                                                                                                                                                                                                                            Modified firefly luciferase luc+.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aplskevgeavakrf 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acvrfshardpifgng---iipdtailsvvpfhhgfgmfttlgylic----gfrvvl--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               apandiynerellnsmnisqptvvfvskkglqkilnvqkklpiiqkiiimdsktdyqgfq 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav--- 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --myrfexelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                   94US-0354240
                                                        94US-0354240
                                                                                                                                                           /note=
: 549
                                                                                                                                     /note=
550
                                                                                                                                                                                                      /note= "wild type Asn replaced 119
                                                                                                                                                                                                                            Location/Qualifiers 50
                                                                                                                          /note=
                                                                                                                                                                                                                                                                                                                                                                                                                             Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11.0%;
                                                                                                                                               "wild
                                                                                                                                                                     "wild
                                                                                                                         "wild type Lys replaced
                                                                                                                                                                                                                                                                                                                                                                                                                              550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       54;
                                                                                                                                                                     type Ser
                                                                                                                                                                                         type Asn replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 169; DB 17;
Pred. No. 9.9e-09;
                                                                                                                                               type Lys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                               replaced
                                                                                                                                                                    replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        119;
                                                                                                                         bу
                                                                                                                                               γď
                                                                                                                                                                                         γd
                                                                                                                                                                    by Ile'
                                                                                                                                                                                                               by Asp'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 550;
                                                                                                                                                Ala"
                                                                                                                                                                                           Gly"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17;
```

```
RESULT 10
W32937
ID W32937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SXCCCCCCCCX PX TTX RR X PA
 밁
                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                              2
                                                                                                                                                                                                                                                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present sequence is encoded by the modified firefly luciterase CDNA luc+, which can be used as a reporter gene in experimental biological systems, e.g. cell cultures, transgenic plants and animals, and in cell free expression systems. Removal of the cDNA peroxisomal translocation sequence yields a cytoplasmic form of the enzyme with optimal substrate availability. Potentially interfering restriction sites and genetic regulatory sites are removed, and codon usage for mammalian cells is improved. Absence of ifficient in Polycosylation sites minimises post-translational
Key
                                                                                    Firefly; luciferase; mutant; reporter gene; cell culture; transgenic plant; transgenic animal; cell free expressions peroxisomal translocation sequence; cytoplasmic form; lucit restriction site; genetic regulatory site; N-glycosylation
                                                                                                                                                                                                                       W32937;
                             Synthetic
                                         Photinus pyralis
                                                                                                                                                                                                                                                     W32937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sherf BA,
                                                                         post-translational
                                                                                                                                                             Modified firefly luciferase luc+NF
                                                                                                                                                                                            22-JAN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      modification.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Modified luciferase
                                                                                                                                                                                                                                                                                                                             317
                                                                                                                                                                                                                                                                                                                                                        274
                                                                                                                                                                                                                                                                                                                                                                                     265
                                                                                                                                                                                                                                                                                                                                                                                                                 218
                                                                                                                                                                                                                                                                                                                                                                                                                                              215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                           aplskevgeavakrf 331
                                                                                                                                                                                                                                                                                                                                                        ---SERVQAATIKRF 285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1997-479459/44
                                                                                                                                                                                                                                                                                                                                                                                  ----myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                                                                                                                                                                                                                                                                                                                                                           acvrfshardpifgnq---iipdtailsvvpfhhgfgmfttlgylic----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a pandiy nerelln s \texttt{mgisqptvvfvskkglqkilnvqkklpliqkilimdsktdyqgfq}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ievdityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav---
                                                                                                                                                                                                                                                                                                                                                                                                               PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 Similarity 74; Conserv
                                                                                                                                                                                                                                                   standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Columns 25-28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Wood KV;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         550 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                          (first entry)
Location/Qualifiers
                                                                                                                                                                                                                                                   Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene - encoding cytoplasmic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10.9%;
23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     encoded by the modified firefly luciterase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   31pp; English.
                                                                                                                                                                                                                                                     551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 168; DB 18; Pred. No. 1.3e-08;
                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                form of luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               550;
                                                                                                                                                                                                                                                                                                                                                                                                                                           -gfrvvl--
                                                                                                                    system;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               68;
                                                                                       site;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                  273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     67
                                                                                                                                                                                                                                                                                                                                                                                     316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            108
                                                                                                                                                                                                                                                                                                                                                                                                                                              264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  17;
```

V

```
Вþ
                                                                                         Qy
                                                                                                                 В
                                                                                                                                      Qy
                                                                                                                                                                밁
Ş
                      ₽
                                            δÃ
                                                                                                                                                                                   δÃ
                                                                                                                                                                                                            В
                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local :
                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                     cDNA luc+NF, which can be used as a reporter gene in experimental biological systems, e.g. cell cultures, transgenic plants and animals, and in cell free expression systems. Removal of the cDNA's peroxisomal translocation sequence yields a cytoplasmic form of the enzyme with optimal substrate availability. Potentially interfering restriction sites and genetic regulatory sites are removed, and codon usage for mammalian cells is improved. Absence of potential N-glycosylation sites minimises post-translational modification. The variation at 5'-end of the cDNA was designed for easier construction of amino-terminal fusions.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Disclosure; Columns 31-36; 31pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sherf BA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-DEC-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12-DEC-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note=
Misc-difference 549
                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                       The present sequence is encoded by the modified firefly luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      enzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Modified luciferase gene - encoding cytoplasmic form of luciferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23-SEP-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US5670356-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (PROM-) PROMEGA CORP.
 274
                      266
                                             218
                                                                    216
                                                                                            162
                                                                                                                   164
                                                                                                                                         109
                                                                                                                                                                104
                                                                                                                                                                                     8
                                                                                                                                                                                                            48
                                                                                                                                                                                                                                                                     Local Similarity
                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                       1997-479459/44
                                                                   acvrfshardpifgnq---iipdtailsvvpfhhgfgmfttlgylic-----gfrvvl--
                                                                                                                 smytfvtshlppgfneydfv---
                                                                                                                                                             a pandiy nerelln s \texttt{mgisqptvvfvskkglqkilnvqkklpiiqkiiimdsktdyqgfq}
                                                                                                                                                                                     VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP-
                                                                                                                                                                                                           ievdityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav---
---SERVQAATIKRF
                      ----myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                             PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                           VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                         74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         T88244.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Wood KV;
                                                                                                                                                                                                                                                                                                                   551 AA;
                                                                                                                                        -GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN
                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9405-0354240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            94US-0354240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note=
551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note=
550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note=
120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note=
                                                                                                                                                                                                                                                                     10.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "wild
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "wild
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "wild type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "wild type Asn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "wild
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "wild
                                                                                                                                                                                                                                                         53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                type
                                                                                                               -pesf---
                                                                                                                                                                                                                                                                     Score 168; DB 18; Pred. No. 1.3e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                type Lys
                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Asn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Glu
                                                                                                                 -drdktialimnssgstglpkgvalphrt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                replaced
                                                                                                                                                                                                                                                          120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                þу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                by Val"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      by Ala"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            by Ile"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   by Gly"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         by Asp"
                                                                                                                                                                                                                                                                              Length 551;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Val-Thr"
                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                         68;
                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                               67
                                                                                                                                        161
                      317
                                                                                           217
                                             273
                                                                    265
                                                                                                                 215
                                                                                                                                                                                     108
                                                                                                                                                                                                            103
                                                                                                                                                                                                                                                         17;
```

```
RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RESULT RE
                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                          QУ
                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
20
                                                  밁
                                                                                           Qy
                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Fused gene with characteristics of component parts - comprising gene conferring conditional growth advantage and a marker gene, used as a probe to select and isolate genetic elements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R28127;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R28127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     See also R28125.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Disclosure; Page 33; 53pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Crosby WL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30-MAR-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene recovery
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Neomycin phosphotransferase-II; genetic selection; genetic marker;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Lux::npt-II
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12-MAR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The sequence is that of the fusion
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-PSDB; Q30000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (CANA ) NAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          28-MAR-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15-OCT-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W09217593-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      318
     274
                                                                                                                                                                                                   162
                                                                                                                                                                                                                                                 163
                                                                                                                                                                                                                                                                                                 109
                                                                                                                                                                                                                                                                                                                                                  103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P.pyralis) luciferase:neomycin
                                                                                                                                                                                                                                                                                                                                                                                                  68
                                                                                                                                                                                                                                                                                                                                                                                                                                                47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VAITLTRSQLYRRTLNVAQELSRCG-STGDRVVISAPQGLEYVVAYLGALQAGRIAVPLS:::|:::||:::|||:||:||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |:| | |||
aplskevgeavakrf
  ---SERVQAATIKRF 285
                                                                                                                                                                          VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1992-366262/44
                                                ----myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                                PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                                                                                                                                acvrfshardpifgng---iipdtailsvvpfhhgfgmfttlgylic-----gfrvvl--
                                                                                                                                                                                                                                                 smytfvtshlppgfneydfv----pesf----drdktialimnssgstglpkgvalphrt
                                                                                                                                                                                                                                                                                               -----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGVVMSHQN 161
                                                                                                                                                                                                                                                                                                                                             apandiynerellysmnisqptvvfvskkglqkilnvqkklpiiqkiiimdsktdyqgfq
                                                                                                                                                                                                                                                                                                                                                                                               VPQGGVTDERSDSV-LSDSSPVAILTTSSAVDDVVQHVARRP--
                                                                                                                                                                                                                                                                                                                                                                                                                                        ievnityaeyfemsvrlaeamkryglntnhrivvcsenslqffmpvlgalfig-vav---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Datla RSS,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RES COUNCIL CANADA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             fusion
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          91US-0676432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          92WO-CA00139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Hammerlindl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ŘΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ion protein encoded by phosphotransferase-II
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     168; DB 13;
No. 2.3e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Selvaraj
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 815;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the firefly chimeric gen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                            217
                                                                                                                                                                                                                                                                                                                                                  162
                                                                                                                                                                                                                                                                                                                                                                                                  108
                                                                                                                                                                                                                                                                                                                                                                                                                                                102
                                                  316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                67
                                                                                                   273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17;
```

밁

```
RESULT
W92747
ID W3
XX
XX
XX
AC W3
XX
DT 01
DT 01
XX
DE P
XXX
L
XX
KW 1.
XX
P
OS P
XX
V
OS P
XX
V
W
                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 73; Conserv
                                                                                                                                                                                                                                                                                          This invention describes a novel recombinant mutant luciferase having a Km for ATP which is increased as compared to the wild type luciferase. This mutant can be used to measure the steady-state ATP concentration of a biological sample, e.g. a whole cell. Only when the Km is in the same order of magnitude or greater than the ATP concentration, can there be a degree of proportionality between changes in ATP concentration and changes in light intensity emitted by the luciferase. This sequence represents a Photinus pyralis luc protein used in the method of the
                                                                                                                                                                                                                                                                                                                                                                                                              Mutant 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Luc protein; luciferase; light intensity.
                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                        Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Lowe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (MINA ) UK SEC FOR DEFENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11-APR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            07-APR-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22-OCT-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W09846729-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Photinus pyralis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           P. pyralis luc protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 06-MAY-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W92747 standard; Protein; 550 AA
  265
                                                               162
                                                                                   163
                                                                                                        109
                                                                                                                            103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           317 aplskevgeavakrf 331
                                                                                                                                                8
                                                                                                                                                                    47
                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12
                                                                                                                                                                  VRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGL--VIG--ICAPILGGYPAVLTS
                                                                                                                           apandiynerellnsmnisqptvvfvskkglqkilnvqkklpiiqkiiimdsktdyqgfq
                     PVSFLQRPARWMHLMA-SDFHAFSA--APNFAFELAARRTTDDDMAGRDLGNILTILSG-
                                         acvrfshardpifgng---iipdtailsvvpfhqgfgmfttlgylic-----gfrvvl--
                                                                                 smytfvtshlppgfneydfv---pesf----drdktialimnssgstglpkgvalphrt
                                                                                                                                               VPQGGVTDERS-DSVLSDSSPVAILTTSSAVDDVVQHVARRP---
                                                                                                                                                                                                                                                                                                                                                                                                            luciferase with increased concentration in a cell
-myrfeeelflrslqdykiqsallvptl-fsffakstlidky---dlsnlheiasgg
                                                                                               ----GESPPSIIEVDLLDLDAPNGYTFKEDEYPSTAYLQYTSGSTRTPAGYVMSHQN 161
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Murray JAH,
                                                                                                                                                                                                                                                              550 AA;
                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                       Fig 8; 30pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97GB-0007486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98WO-GB01026
                                                                                                                                                                                                                     10.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Squirrell DJ,
                                                                                                                                                                                                                                                                                                                                                                                        English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Km;
                                                                                                                                                                                                           Score 162; DB 20; Pred. No. 5.1e-08; 54; Mismatches 120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mutant;
                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       steady-state ATP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                White
                                                                                                                                                                                                                                                                                                                                                                                                                        ATP
                                                                                                                                                                                                                                                                                                                                                                                                                        •
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ŗ,
                                                                                                                                                                                                                                                                                                                                                                                                                      useful for measuring
                                                                                                                                                                                                                                Length 550;
                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        concentration;
                                                                                                                                                                                                           Gaps
                                                                                                                            162
                                                                                                                                                                     102
                                                              217
                                                                                  214
                                                                                                                                                108
                                                                                                                                                                                         67
                     273
                                          264
                                                                                                                                                                                                            17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
R13896
  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρ
                                        28-FEB-1990;
28-FEB-1990;
02-JUL-1990;
03-OCT-1990;
                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Key
Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         R13896
 Veenstra
                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R13896;
                    (KONN)
                                                                                                        27-FEB-1991;
                                                                                                                                               EP445868-A.
                                                                                                                                                                                         Domain
                                                                                                                                                                                                           Region
                                                                                                                                                                                                                                                    Region
                                                                                                                                                                                                                                                                        Region
                                                                                                                                                                                                                                                                                                        Domain
                                                                                                                                                                                                                                                                                                                          Region
                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                       Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Acremonium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Beta lactam antibiotics;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACV synthetase
                                                                                                                             11-SEP-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22-NOV-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           317 aplskevgeavakrf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---SERVQAATIKRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           standard;
                     GIST-BROCADES NV
ΑE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     chrysogenum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
Martin JF,
                                        91EP-0200423.
90EP-0200475.
90EP-0200488.
90EP-0201768.
90EP-0202628.
                                                                                                       91EP-0200423
                                                                                                                                                                     /function= thioesterase
                                                                                                                                                                                3560..3647
/label- IV
                                                                                                                                                                                                                                                                /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301..1068
                                                                                                                                                                                                                                                                        'function= activation
1554..2603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'label= subdomain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Protein;
                                                                                                                                                                                                                       label=
                                                                                                                                                                                                                                                                                                                                     rabel=
                                                                                                                                                                                                                                                                                                                                                                               label=
                                                                                                                                                                                                                                                                                                                                                                                                  function= activation
                                                                                                                                                                                                                                                                                                                                                                                                                       392..2154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 function= activation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            label-
                                                                                                                                                                                                                                                                                                                                                          label=
                                                                                                                                                                                                                                                                                                                                                                                                            label-
                                                                                                                                                                                                                                                                                                                                                                                                                                                    label= subdomain
                                                                                                                                                                                                   label-
                                                                                                                                                                                                                                                                                                       label= subdomain
474..3295
                                                                                                                                                                                                                                                                                                                                                                                                                                  label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             label= subdomain
                                                                                                                                                                                                                                            label-
                                                                                                                                                                                                                                                    el= subdomain
                                                                                                                                                                                                                                                                                                                                                                                          ..1518
                                                                                                                                                                                                                                                                                                                             ..1846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             331
                                                                                                                                                                                                                                                                                                                                                                                                                                             . 754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                285
                                                                                                                                                                                                                                                                                                                                                                     .1590
                                                                                                                                                                                                                                                                                                                                                .1789
                                                                                                                                                                                                   subdomain
                                                                                                                                                                                                                                           subdomain
                                                                                                                                                                                                                                                                                                                                      subdomain
                                                                                                                                                                                                                                                                                                                                                          subdomain
                                                                                                                                                                                                                                                                                                                                                                               subdomain
                                                                                                                                                                                                                                                                                                                                                                                                                                  subdomain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        penicillin
Garcia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
A
BD,
 Guttierez
                                                                                                                                                                                                                                                                                   of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                                                                                                                                                                                                   of
                                                                                                                                                                                                                                                                                   amino acid substrate
                                                                                                                                                                                                                                                                                                                                                                                                   amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 amino acid substrate
                                                                                                                                                                                                                                                                                                                                                                                                   acid
                                                                                                                                                                                                                                                                                                                                                                                                   substrate
  Barredo
```

ℓ_₽

Q 밁 Qy

밁 δÃ В δÃ B δÃ

Ò

```
RESULT 14
R40227
ID R40227
XX R40227
XX R40227
XX R40227
XX D1-FEB
XX D2-FEB
XX D4-FEB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SX CC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The DNA sequence was obtd. from five subclones isolated from a gene library of A. chrysogenum ClO (APCC 48). The protein sequence was deduced from the DNA. Three distinct regions of homology have been identified, domains I, II and III. Within these domains several even more conserved elements can be distinguished. Since the enzyme synthesises a tripeptide, which most probably requires the activation of three amino acids, a role for these domains in the activation reactions seems likely. A fourth domain is thought to act as a thioesterase. The gene can be used to express the synthetase enzyme which can be used for the prodn. of new beta-lactam antibiotics.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2615
                              JP05192162-A
                                                                    Acremonium chrysogenum
                                                                                                              Delta-(L-alpha-aminoadipyl)-L-cystinyl-D-valine synthase; ACVS; beta-lactam; antibiotic; transformed; cephalosporin; vector.
                                                                                                                                                                                                                                                                         R40227;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2555 avvldspetlaclngqskenpttstqkpsdlayviftsgttgkpkgvlvehqsvvqlrns 2614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 1; Page 20; 54pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNA encoding amino:adipyl-cysteinyl-valine prodn. of the enzyme or enhanced prodn. of
                                                                                                                                                                                                                               21-FEB-1994
                                                                                                                                                                                                                                                                                                                     R40227 standard; Protein; 3639
                                                                                                                                                                                                                                                                                                                                                                                                                                 2719 fa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2510 gaayvpldpt---ypsqrtelileessartlittr-----khtpr-----ggtvanvp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   beta-lactam antibiotic cpds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N-PSDB; Q13608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2669 digrreklsylsgtpsvlqqielsr--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Montenegro PE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              289 FA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7 DGVAI----TLTRSQLYRRTLNVAQELSRCGS--TGDRVVISAPQGLEYVVAYLGALQA 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             lieryfgetng----shavlflsnyvfdfsle-qlclsvlggnklii-ppeegltheafy 2668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LLDLDAPN-----GYTFKEDEYPST-----AYLQYTSGSTRTPAGVVMSHQNVRVNFEQ 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      driaiadgtrslsyselneranglvhliissasivaddriallldksidmviallavwka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1991-268735/37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVD 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   290
                                                                                                                                                                                                                                                                                                                                                                                                                                      2720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3712 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Von
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Doehren
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 161.5; DB 1
Pred. No. 9.8e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Palissa H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---lphlhmvtaageefhasqfekmrsq 2718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        synthetase -
new or known
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Van Liempt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Η;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                used
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3712;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11;
                                                                                                                                                                                                                                                                                                                                                                                     RESULT
R53923
    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The sequence (Q48231) is of a vector which includes the delta-(L-alpha-aminoadipyl)-L-cystinyl-D-valine synthase gene. This sequence was transformed into a host cell to express the ACVS product. The protein produced (R40227) was then used to manufacture a beta-lactam antibiotic.
  08-SEP-1992;
                                                                                                                                                                                                                                                                      02-FEB-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA coding delta-(L-alpha-amino-adipy1) L-cystiny1 D-valine synthase - for improved productivity of cephalosporin antibiotics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 1993-277475/35
N-PSDB; Q48231.
                                              05-APR-1994.
                                                                                         JP06090747-A
                                                                                                                                   Pseudomonas fragi
                                                                                                                                                                                Acyl Co-A syntetase;
                                                                                                                                                                                                                          Acyl CoA synthetase
                                                                                                                                                                                                                                                                                                                   R53923
                                                                                                                                                                                                                                                                                                                                                             R53923 standard; Protein; 563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2646 fa 2647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2596 digrreklsylsgtpsvlqqielsr-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2542 lieryfgetng----shavlflsnyvfdfsle-qlclsvlggnklii-ppeegltheafy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2482 svvldspetlaclnggskenpttstgkpsdlayviftsgttgkpkgvlvehgsvvqlrns
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2437 gaayvpldpt---ypsqrtelileessartlittr-----khtpr----ggtvanvp 2481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2377 driaiadgtrslsyselneranqlvhliissasivaddriallldksidmviallavwka 2436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 1; Page 14-27; 69pp; Japanese
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (TAKE ) TAKEDA CHEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     31-JUL-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25-JUL-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              03-AUG-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           289 FA
                                                                                                                                                                                                                                                                                                                                                                                                            15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7 DGVAI-----TLTRSQLYRRTLNVAQELSRCGS--TGDRVVISAPQGLEYVVAYLGALQA 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPILGGYPAVLTSPVSFLQRPARW 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LLDLDAPN-----GYTFKEDEYPST-----AYLQYTSGSTRTPAGVVMSHQNVRVNFEQ 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GRIAVPLSVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARRPGESPPSIIEVD 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGNILTILSGSERVQAATIKRFADR 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          l Similarity
69; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3639 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                      (first
    92JP-0239842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     90JP-0205677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 91JP-0186222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10.4%;
22.8%;
                                                                                                                                                                                  .
P
                                                                                                                                                                             fragi; transformation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 160.5; I
Pred. No. 1.2e
55; Mismatches
```

.2e-06; DB 14;

Indels Length 3639;

49;

Gaps

11;

---lphlhmvtaageefhasqfekmrsq

2645

2595

2541

[F] coli.

```
Search completed: January Job time: 200 sec
                                                                                                                                                      В
                                                                                                                                                                                 Q
                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 71; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This sequence represents acyl Co-A synthetase which was isolated from P. fragi. The gene encoding this protein may be used to transform E. coli. The effective production of acyl Co-A synthetase can be achieved using the transformed E. coli. This allows the protein engineering of acyl Co-A synthetase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                E. coli transformed to produce acyl co-A synthetase and DNA coding for the enzyme - is useful for recombinant prodn. of acyl co-A synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 1994-146984/18.
N-PSDB; Q63900.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Claim 1; Fig 1; 14pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           08-SEP-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (ASAH ) ASAHI KASEI KOGYO KK
                                                                                                                                                      275 flgnhnilisnprdl---pamvkelskwkftgfvglntlfvalc---nneafrkldfsa 327
                                                                                                                                                                                                                                                                                             158
                                                                                                                                                                                                                                                                                                                                                           109 ----ytaremehqfkdsgakalvclan----mahlaekvvpqtsvkyvivtevadml 157
                                                                                                                267 ILTILSGSERVQAATIKRF 285
                                                                                                                                                                                      208 -LGGYPAVLTSPVSFLQRPARWMHLMASDFHAFSAAPNFAFELAARRTTDDDMAGRDLGN 266
                                                                                                                                                                                                                                                                                                                            125 AP-----AYLOYTSG 147
                                                                                                                                                                                                                                                                                                                                                                                                 67
                                                                                                                                                                                                                                                                                                                                                                                                                                   49
                                                                                                                                                                                                                                                                                                                                                                                                                                                   12 TLTRSQLYRRTLNVAQELSRCG--STGDRVVISAPQGLEYVVAYLGALQAGRIAV---PL 66
                                                                               : ||| :| : :|:
lkvtlsggmalqlsvaerw 346
                                                                                                                                                                                                                     tgvakgamlshrnlianmlqckalmasnld---egcellitplplyhiyaftfhcmamm
                                                                                                                                                                                                                                                                                          spfkrvlinsvikyvkkmvpayhlpqaikfndvlskgqgqpvkeaspvssdvavlqytgg 217
                                                                                                                                                                                                                                                           STRTPAGVVMSHQNVRVNFEQLMSGYFADTDGIPPPNSALVSWLPFYHDMGLVIGICAPI 207
                                                                                                                                                                                                                                                                                                                                                                                                 SVPQGGVTDERSDSVLSDSSPVAILTTSSAVDDVVQHVARR--PGESPPSIIEVDLLDLD 124
                                                                                                                                                                                                                                                                                                                                                                                                                                   titygelyeqsgafaawlqqhtdlqpgdriavqlpnllqypiavfgairaglivvntnpl 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           563 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           92JP-0239842.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9.7%;
                5
                2001, 14:26:43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    %; Score 150; DB 15;
%; Pred. No. 8.8e-07;
48; Mismatches 134;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 563;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels 66; Gaps
                                                                                                                                                                                                                          274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11;
```

i

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Scoring
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OM nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tal number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB
Bd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nucleic search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     : Minimum
Maximum
Listing
  EST:*
1: gb
2: gb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hits satisfying
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gapop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7991742 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDENTITY_NUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-09-461-774-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   January 12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gccaccacccttcccgttca....agatccggtccaccaactga
jb_est8:*
gb_est19:*
gb_est11:*
gb_est11:*
gb_est11:*
gb_est14:*
gb_est15:*
gb_est15:*
gb_est17:*
gb_est17:*
gb_est17:*
gb_est21:*
gb_est21:*
gb_est21:*
gb_est21:*
gb_est21:*
gb_est21:*
gb_est21:*
gb_est21:*
gb_est23:*
gb_est23:*
gb_est24:*
gb_est23:*
gb_est24:*
gb_est23:*
gb_est24:*
gb_est23:*
gb_est24:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gb_est1:*
gb_est2:*
gb_est3:*
gb_est4:*
gb_est5:*
gb_est6:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      n Match 0%
n Match 100%
y first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GenCore version (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2001, 18:01:37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gapext
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3503743858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ٠.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 4.5
Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Search time 3358.72 Seconds (without alignments) 901.306 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15983484
```

```
44: em_esthum2:*
46: em_esthum3:*
46: em_esthum3:*
48: em_esthum5:*
49: em_esthum6:*
49: em_esthum6:*
50: em_esthum9:*
51: em_esthum9:*
52: em_esthum9:*
53: em_esthum11:*
56: em_esthum11:*
57: em_esthum11:*
58: em_esthum16:*
68: em_esthum16:*
68: em_esthum11:*
68: em_esthum19:*
69: em_esthum19:*
61: em_esthum19:*
63: em_esthum19:*
64: em_esthum19:*
65: em_esthum19:*
66: em_esthum19:*
67: em_esthum19:*
68: em_esthum10:*
69: em_esthum10:*
69: em_esthum10:*
69: em_esthum10:*
69: em_estro0:*
69: em_estro1:*
68: em_estro1:*
68: em_estro1:*
68: em_estro1:*
69: em_estro1:*
69: em_estro1:*
69: em_estro1:*
69: em_estro1:*
69: em_estro1:*
69: gb_est4:*
69: gb_est5:*
69: gb_est5:*
69: gb_est5:*
69: gb_est5:*
69: gb_est6:*
69: gb_es
```

```
117: em_estpl6:*
119: em_estpl8:*
120: em_estpl8:*
121: em_estr014:*
122: em_estr014:*
123: em_estr015:*
124: em_estr015:*
125: em_estr016:*
126: gb_est60:*
127: gb_est60:*
130: gb_est60:*
131: gb_est61:*
132: gb_est61:*
133: gb_est61:*
134: gb_est61:*
135: gb_est61:*
136: gb_est61:*
137: gb_est61:*
138: gb_est61:*
139: gb_est61:*
139: gb_est61:*
140: gb_est61:*
141: gb_est61:*
142: gb_est77:*
133: gb_est77:*
134: gb_est81:*
145: gb_est81:*
146: gb_est81:*
147: gb_est81:*
148: gb_est81:*
149: gb_gss1:*
149: gb_gss2:*
150: gb_gss1:*
151: em_gss4:*
152: em_gss4:*
153: em_gss4:*
154: gb_gss1:*
156: gb_gss1:*
157: gb_gss1:*
158: gb_gss1:*
159: gb_gss1:*
160: em_gss1:*
161: em_gss1:*
162: em_gss1:*
163: gb_gss1:*
164: em_gss1:*
165: em_gss1:*
166: gb_gss1:*
167: gb_gss1:*
168: gb_gss1:*
169: gss2:*
169: gss2:*
160: gb_gss1:*
160: gb_gss1:*
161: em_gss1:*
162: em_gss1:*
163: gb_gss2:*
164: gb_gss2:*
165: em_gss1:*
166: gb_gss1:*
167: gb_gss1:*
168: em_gss1:*
169: gss2:*
169: gss2:*
160: gb_gss1:*
160: em_gss1:*
160:
```

Э	9	191:	9
2000	_gss27 :	gb_gss26:*	gss25:

Pred. No. is the number of results predicted by chance to happer a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

											ი			a		O						O			Ω						O									a	a			Result No.
ъ. П	44	43	42	41	40	39	38	37	36	ω S	34	ω	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	3 1	12	1 -	9	œ	7	6	ران نان	4	w	N	_	ult.
	7	.7	7.	38	38	38	38	38	38.2	38.2	38.2	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.6	38.8	38.8	39	39	39.2		•	40	0	0		^ 4 1	41.6	41.8	Ë		5	7	9	50.6	94.4	Score
8.7				٠		•					•	٠				٠		•						٠		٠					9.3			оч л 0	9.0		•		10.6	10.9	11.4	11.7	21.9	ch
645	630	520	429	815	525	510	486	360	703	498	455	587	569	561	550	533	479	468	460	436	395	672	1011	605	530	458	522	413	716	684	613	377	803	177	531	389	344	414	925	925	515	632	120	Length 1
190	29	109	139	110	38	38	38	29	173					95										38		9	34	0	110	107	39	110	109	110	109	110	88	9	190	190	σ.	20	7 A	DB 1
2	088616	E538		BE642085	AV643920	530	360	753	AQ961090		A1998089	AW065954	AI649680	AW787652	AW216208	AW787653	AW244212	AJ285761	C96792	C97495	D46616	AW355915	AA415082	BE975061	AU084876	AU084061	BE056217	AW097916	BE636656	8731	091035	E59539	BE558685	BF584146	BE552631	60	AW287529	0936	200	9	43439	BE21	A46507	ID
AL101589 Drosophil	AU088616 AU088616	BE538706 601064693	C28526 C28526 Rice	BE642085 Cri2_5_B1	AV643920 AV643920	AV645301 AV645301	AV643609 AV643609	AUU//535 AUU//535	AQ961090 LEREGIZIR	AU083644 AU083644	A1998089 /U16/2121	AWU65954 68/003F09	A1649680 486077G04	AW787652 945011H09	AW216208 687043C07	AW787653 945011H09	AW244212 687050H07	AJ285761 4A3B-AAW-	C96792 C96792 Rice	C97495 C97495 Rice	D46616 RICS11393A	AW355915 707016A04	AA415082 Mg0016 RC	BE975061 bs38b09.y	AU084876 AU084876	AU084061 AU084061	BE056217 '945030E10	AW097916 qa03e06.y	BE636656 rockefell	BE387312 601275760	AW091035 614070A12	BE595391 PI1 53 F1	E55868	9-8F-HA	BE552631 946082H01	360	87529 LG1_242_C	617	3013	3013 Drosc	434394 AV434	BE214663 HV	AA465078 EST_Luber	Description

ALIGNMENTS

RESULT

_

KEYWORDS	VERSION	ACCESSION			DEFINITION	LOCUS	AA465078
EST.	AA465078.1 GI:2191218	AA465078	sequence.	tuberculosis cDNA clone Lubert similar to 14 kD antigen, mRNA	EST_Lubert Mtb FOX (5% oxygen) expression library Mycobacterium	AA465078 120 bp mRNA EST 08-MAR-2000	

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAL
MEDLINE
COMMENT
                                                                                                                                                     ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOURCE
ORGANISM
                                                                                                                   SOURCE
                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                LOCUS
                                                                                                                                                                                                                                                                 BE214663
                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                  KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 95
                                                                                                  ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                 301 gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt 360
                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                 _
                                                                                                                                                                                                                                                                                                                                      GTGTCNCTGCCGGTATGTGCTGACGACGACGACATTAANGCCNCCTACNACNAGGGCATT
                                      Hordeum vulgare
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; Liliopsida; Poales; Poaceae; Hordeum.
1 (bases 1 to 632)
                                                                                                                                                                     BE214663 632 bp mRNA EST 25-JUL-2000 HV_CEb0004C06f Hordeum vulgare seedling green leaf EST library HVcDNA0005 (Erysiphe infected & control) Hordeum vulgare cDNA clone HV_CEb0004C06f, mRNA sequence.

BE214663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DKF, Tiefenaustr. 120,
Tel: ++41 31 308 80 10
Fax: ++41 31 308 80 28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium tuberculosis
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Wing,R., Close,T.J., Kleinhofs,A., Wise,R., Begum,D., Frisch,D., Y, Y., Anderson,H., Dale,J., Henry,D., Kernodle,S., Palmer,M., Rambo
                                                                                                                                  EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Imboden, P. and Schoolnik, G.K.

Construction and characterization of a partial Mycobacterium
                                                                                                                                                       BE214663.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   position 319-420 in S79751
Insert Length: 99 Std Error
Plate: 1 row: D column: 12.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98296259
                                                                                                                   barley.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      University of Berne
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Research
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Contact: Paul
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tension
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Institute for Medical Microbiology at the Department of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tuberculosis cDNA library of genes expressed at reduced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacterium tuberculosis complex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bases 1 to 120)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           213 (1-2), 107-117 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /clone_lib="Mtb FOX (5% oxygen) expression library"
/dev_stage="late log phase"
/lab_host="Escherichia coli strain Novablue (Novagen)"
/lab_host="Escherichia coli strain Novablue (Novagen)"
/note="Yector: pET24a (+) (Novagen); Site_1: EcoR1;
Site_2: EcoR1; total RNA isolated from liquid cultures
grown to late log phase in Middlebrook 7H9/ADC in an
atmosphere of 5% oxygen, 5% CO2 and 90% Nitrogen. Random
fragments were amplified from total RNA by rPCR with the
primer UPNS (5'-GCCGGAGCTCTGCAGAATCNNNUNN-3') and cloned
into EcoR1 site of pET24a (+). Clones from M.tb ribosomal
RNA were detected by hybridization and removed."

24 a 30 c 33 g 26 t 7 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           pimboden@imm.unibe.ch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="taxon:1773"
/clone="Lubert"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Mycobacterium tuberculosis"
/strain="PI, ATCC_51910"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1. .120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                       GI:8902275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Imboden
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Std Error:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 94.4; DB 7; Pred. No. 3.5e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Berne,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Switzerland
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 120;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             oxygen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Clinical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                              RESULT 3
AV434394/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BASE COUNT
ORIGIN
                                                                                                                                                                                    VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMMENT
                                                                                                REFERENCE
                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                               LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FEATURES
                                                                                                                                                                       SOURCE
                                                                                                                                                                                                                           ACCESSION
   JOURNAL
                                        TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
```

```
Query Match
Best Local Similarity
Matches 125; Conserv
                                                                                      AUTHORS
                                                                                                                                                                        ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       170 ccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatca 229
                                                                                                                                                                                                                                                                                                                                                                                                                                   458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            278 TCGTCGTACGCACCGAGCTGGACGCTGGTGACGCGGAAGTCCACGGCCGCCGAGGCGGCT 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                230 aggccgagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgtacggttcct 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                218
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttcagatccggtc 422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCCACGGCGTACTGACTGTGACGGTGCCCANGATGCACAACCNGGCCCCGGCCATGGTCA 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tcgttcgcacggtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacg 349
                                                                                                                                                                                                              AV434394 515 bp mRNA
AV434394 Porphyra yezoensis TU
PW042e12_r 5', mRNA sequence.
AV434394 RT:8589619
EST
                                                                                                                                                                                                                                                                                                                                                                                                                                   ATCTCATCGGGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acaagggcattcttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcaca 409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TCGCGAGGAAGTTCCNGCTGCCGGNGATGGTGGACGCTGACGGGATCACGGCCGAGTACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCGACCTCCCAGGCGTGAAGAAGGAGGAGATCAGGGTGGAGATTGAGGACGGGAGGTACC · 277
Generation of 10,154 expressed sequence tags from a leafy gametophyte of a marine red alga, Porphyra yezoensis DNA Res. 7, 223-227 (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     100 Jordan Hall, (Tel: 864 656 7288 Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Clemson University Genomics
Clemson University
                                                                  Tabata, S.
                                                                                  Nikaido, I., Asamizu, E., Nakajima, M., Nakamura, Y.,
                                                                                                                                                                      Porphyra
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 High quality sequence start: 41 High quality sequence stop: 399.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Email: rwing@clemson.edu
Seq primer: AATTAACCCTCACTAAAGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \ensuremath{\mathsf{Wood}}\xspace,\ensuremath{\mathsf{T}}\xspace. Development of a genetically and physically anchored
                                                                                                                                                                                              Porphyra yezoensis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for barley genomics
                                                                                                                              Porphyra.
                                                                                                                                                  Eukaryota; Rhodophyta;
                                                                                                          (bases 1 to 515)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Saski, C., Schwartzbeck, J., Simmons, J., Choi, D.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          а
                                                                                                                                                                      yezoensis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /clone_lib="Hordeum vulgare seedling green leaf EST
library HVcDNA0005 (Erysiphe infected & control)"
/tissue_type="seedling green leaf"
/lab_host="SOLR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Hordeum vulgare"
/cultivar="CI16151 (Mla6)"
/db_xref="taxon:4513"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Vector: lambdaZAP; Site_1: EcoR1; Site_2: Xho1"
177 c 190 g 120 t 7 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /clone="HV_CEb0004C06f"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1. .632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                   470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11.78;
49.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 50.6; Di
Pred. No. 0.00
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                Bangiophyceae; Bangiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SC
                                                                                                                                                                                                                                                                                                TU-1 Porphyra yezoensis cDNA clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .0018;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                  Bangiaceae;
                                                                                    Saga, N.
                                                                                                                                                                                                                                                                                                                      23-AUG-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EST resource
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Main, D. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
```

```
RESULT 4
CNS0091P/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                              SOURCE
ORGANISM
                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                          REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Snoo
                                                                                                                                                                                                                     AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                      CCESSION
                                                                                                                                                                                                      JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                      FINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ouery Match
est Local Similarity
atches 129; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 acattatggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcaggaggact 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  aagaggggcgctacgaggtacgcgcggagcttcccggggtcgaccccgacaaggacgtcc 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gtgctgacgaggacg-----acattaaggccacctacgacaagggcattcttactgtgt 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TGTCGATTGATGGGGATGTACTGACTGTCCGAGGGGAGAAGCGCTCTGAGCGGGAGGTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACGGGAAGAGCTACGAGTGGGCGGTGGAGCTCCCCGGTCTGTCCAAGGAGGACGTCAAGC 402
Determination of this BAC-end sequence was carried out as part of a collaboration with the Berkeley Drosophila Genome Project (BDGP). The BDGP is constructing a physical map of the Drosophila melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Maron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial
                                                                                                                                                                                                                                                                                                                                                                                                                   fly),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                371
                                                                                                                                                                                  Submitted (02-JUN-1999) Genoscope - Centre BP 191 91006 EVRY cedex - FRANCE (E-mail :
                                                                                                                                                                                                                                                                       Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                                                                     Drosophila melanogaster
BACR19D16 of RPCI-98 lik
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Contact: Erika Asamizu
The First Laboratory for Plant Gene Research
Kazusa DNA Research Institute

    Web : www.genoscope.cns.fr)

                                                                                                                                                                                                                     Direct Submission
                                                                                                                                                                                                                                                                                                                              Drosophila
                                                                                                                                                                                                                                                                                                                                                                   GSS
                                                                                                                                                                                                                                                                                                                                                                                AL053013
AL053013.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CNS0091P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Yana
                                                                                                                                                                                                                                         Genoscope.
                                                                                                                                                                                                                                                                                                                                               fruit fly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Email:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20363100
                                                                                                                                                                                                                                                          (bases 1 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1532-3, Kisarazu, Chiba
                                                                                                                                                                                                                                                                                                                                                                                                                     genomic survey sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     asamizu@kazusa.or.jp, URL:http://www.kazusa.or.jp/en/plant/,
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /strain="TU-1".
/db_xref="taxon:2788"
/db_xref="taxon:2788"
/clone="PM042e12_r"
/clone_lib="Porphyra yezoensis TU-1"
/note="Vector: pBluescriptII SK-; Sit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             XhoI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Porphyra yezoensis"
                                                                                                                                                                                                                                                                                                                              melanogaster
                                                                                                                                                                                                                                                                                                                                                                                    GI:4934461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           198 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     925 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                   ter genome survey sequence TET3 end of BAC library from Drosophila melanogaster (frui
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 49.4; DI
Pred. No. 0.00:
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           125 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292-0812, Japan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ມະ
ປ.0036;
106;
                                                                                                                                                                                  National de Sequencage :
segref@genoscope.cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Site_1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       515;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      03-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ECORI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Site_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1;
```

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                             RESULT
CNS0091P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20
                                        COMMENT
                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                                                                       VERSION
                                                                                                                                                                                                                                                                                         ACCESSION
                                                                                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                           AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local :
                                                                                           JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                  542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62 tcgcggccttcccgtcattcgccggactccggcccaccttcgacaccccggttgatgcggc 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2 ccaccaccettcccgttcagcgccacccgcggtccctcttccccgagttttctgagctgt 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                 CGMMCGKSKSGCTNNNNTNT 522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccgggggtcgacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ttactgtgtcggtggcggttt 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SSCSSSSMSASSSASSSSASSSSSSSSSSSSSACGBSMSSGGGSGSVSASSGMSSSVSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SSVASSMSCSSBSSSSASASSSSSSSSSSSSSCASCCCTSWSCSCSTSASMSAARSSSSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CMCSSSSSCCGSASARGVKVRASGGAGKRGGGSGGASASHSSSSACBSSS----SSCSAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SSBCSSCSSSBSSSSTSSMSSSSBSSSSSGSSSSSGTSSACVKCNASSSCGCCGCGMABC 839
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SGGRSSGSGGGGGVGGSGSSSSGSGSSGSGSVCSCSSGCMCRCSCSSAAAAAASCVAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tgtcgctgccggtaggtgctgacgacgacgacattaaggccacctacgacaagggcattc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         - Web : www.genoscope.cns.fr)
Determination of this BAC-end sequence was collaboration with the Berkeley Drosophila The BDGP is constructing a physical map of
                                                                                                                                                                                                                                                                                                             CNS0091P 925 bp DNA
Drosophila melanogaster genome survey sequence TET3 end of BAC #
BACR19D16 of RPCI-98 library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ECORI digestion of Drosophila DNA provided by the BDGP from the isogenic strain ys. on bw sp, the same strain used for the BDGP's Pl and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be
                                                                       Submitted (02-JUN-1999) Genoscope - Centre BP 191 91006 EVRY cedex - FRANCE (E-mail:
                                                                                                           Direct Submission
                                                                                                                          Genoscope
                                                                                                                                         Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Traccta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                    Drosophila
                                                                                                                                                                                                                                                      GSS
                                                                                                                                                                                                                                                                                                        fly),
                                                                                                                                                                                                                                      fruit fly.
                                                                                                                                                                                                                                                                       AL053013.1
                                                                                                                                                                                                                                                                                         AL05301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative 163;
                                                                                                                                                                                                                                                                                                         genomic survey sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Drosophila
/db_xref="taxon:7227"
/clone_lib="RPCI-98"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="end : TET3"
61 c 61 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /clone="BACR19D16"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                  melanogaster
                                                                                                                                                                                                                                                                       GI:4934461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NO. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        melanogaster"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .014;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              155;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
   the
                       Genome Project
                                      carried out as part of
                                                                                         National de Sequencage
                                                                       segref@genoscope.cns
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    others
     Drosophila
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                     (BDGP).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 723
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1;
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                            KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                       COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γQ
                                                                                                                                                                                                                                                                                                       LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURES
                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                   VERSION
                                                                                                                                                                                                                                                                                                                        AU093617
                                                                                                                                                                                                                                                                                                                                         RESULT
                                                                                                                                                                                                                                                                   ACCESSION
                                                                                     TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        source
                                                                                                                                                                                                                                                                                                                                                                                                 864
                                                                                                                                                                                                                                                                                                                                                                                                                                315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                melanogaster genome using these BACs. For further information please see http://www.fruitfly.org The BDGP Drosophila melanogaster BAC library was prepared by Kazutoyo Osoegawa and Aaron Mammoser in Pieter de Jong's laboratory in the Department of Cancer Genetics at the Roswell Park Cancer Institute in Buffalo, NY. The library is named RPCI-98 and was constructed by partial EcoRI digestion of Drosophila DNA provided by the BDGP from the isogenic strain y2; cn bw sp, the same strain used for the BDGP's P1 and EST libraries. A more detailed description of the library and how to order individual BAC clones, the entire library, or filters for hybridization from the BACPAC Resource Center can be found at http://bacpac.med.buffalo.edu/drosophila_bac.htm.
                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                               aggrgctgacgacgacattaaggccacctacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgttcagcgccacccgcggtccctcttccccgagttttctgagctgttcgcggccttccc 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCSCCCYMCTCCSTYBMBCYTSTSCGGSSSSSGKGGVTKCGCGGCGSSSTNGMBGTSSAC 863
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STSSSSSSYSSSTCSCCTCCCSYSYSSSSTSSSSSTSWGSTSGSSSSSVGTSSSSDSTST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccacattatggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcagaagga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gaaagaggggcgctacgaggtacgcgcggagcttcccggggtcgaccccgacaaggacgt 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gtcattcgccggactccggcccaccttcgacacccggttgatgcggctggaagacgagat 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CSSGSGBSCSCCSSCSCSCSCCBCCCCCSCSSYCCSSSBSSSKCSSTSBSCSCCCSS 623
                                                                                                                                                                                                                                                              AU093617
AU093617 Rice (
AU093617
                                                                                                                                      Oryza sativa.
Oryza sativa
Cryza sativa
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta;
Magnollophyta; Liliopsida; Poales; Poaceae; Oryza.
1 (bases 1 to 414)
                             Contact: Takuji Sasaki
National Institute of Agrobiological Resources
Rice Genome Research Program
                                                                                    Rice cDNA from callus (2000)
Unpublished (2000)
Ibaraki,
              2-1-2 Kannondai,Tsukuba
                                                                                                                       Sasaki, T. and Yamamoto, K.
                                                                                                                                                                                                                                                   AU093617.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Drosophila melanogaster"
/db_xref="taxon:7227"
/clone__ib="ReCI-98"
/clone="BACR19D16"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="end : TET3"
61 c 61 g
                                                                                                                                                                                                                                                   GI:8856299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10.6%;
12.5%;
                                                                                                                                                                                                                                                                                    callus
                                                                                                                                                                                                                                                                                                     414
                                                                                                                                                                                                                                                                                                     ďď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   155;
                                                                                                                                                                                                                                                                                    Oryza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 45.8; DB 190;
Pred. No. 0.034;
                                                                                                                                                                                                                                                                                                     mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                    sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              172
                                                                                                                                                                                                                                                                                    cDNA clone C53625, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            c
                                                                                                                                                                                                                                                                                                                                                                                                 900
                                                                                                                                                                                                                                                                                                                                                                                                                                351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     140;
                                                                                                                                                                                                                                                                                                     EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            511 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                     30-JUN-2000
                                                                                                                                                                          Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
```

В

δõ 망

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                FEATURES
                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                          VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AW287529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
                                                                                                                                                                                                                                                                               AUTHORS
TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches 114;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             281
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    81 cgccggactccggcccaccttcgacacccggttgatgcggctggaagacgagatgaaaga 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cggtcgctcggaattcgcgttacggttccttcgttcgcacggtgtcgctgccgg 313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggggcgctacgaggtacgcgcggagcttcccgggggtcgaccccgaccacaggacgtccacat 200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tatggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcagaaggacttaga 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CACGGGCGACGAGGTGCACGCCTGCCCGGGGATGGACGCCAACGGCAACGGGTCGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGACCAGGCGCACTGCTCGAGGTGTTCCGGGCGTTCGACCGCGACGGCAACGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGAGTTCGACGAGCTGGCGGCGGCGATCGCGCCGGTGCTCACCACGCAGACGCACCTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CGACGGCAGCCTGACGCAGCTGGAGCTGGCGGCGCTGCTGCGGGTCGCTGGGGCTGCGCCC 220
                                                                                                                                                                                     Department of Botany
The University of Georgia
Plant Sciences Building, P
                                                                                                                                                                                                                                            Unpublished (2000)
On Jan 6, 2000 this sequence
Contact: Cordonnier-Pratt MM
                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence. AW287529
                                                                                                                                                                                                                                                                                                                                  Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Sorghum.

1 (bases 1 to 344)
                                                                                                                                                                                                                                                                                                                                                                                                                            EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AW287529 344 bp mRNA EST 19-JUL-2000 LG1_242_C01.b1_A002 Light Grown 1 (LG1) Sorghum bicolor cDNA, mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Tel: 0298-38-7441
Fax: 0298-38-7468
Email: tsasaki@abr.affrc.
                                                                                                                     Email: mmpratt@uga.edu
Sequences have been tr
                                                                                                                                                                                                                                                                                                               Cordonnier-Pratt, M. - M., Gingle, A.,
                                                                                                                                                                                                                                                                                                                                                                                   Sorghum bicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROJECT ='RGP'.
                                                                   Seq primer: JEN REV
                                                                                                    below Phred quality
                                                                                                                                                                                                                                                                                               An EST database from Sorghum:
                                                                                                                                                                                                                                                                                                                                                                                                         sorghum.
                                                                                                                                                                                                                                                                                                                                                                                                                                            AW287529.2
                                                                                      LS 20
                                                                                                                                                       706 542 1860
706 542 1805
                                               quality sequence stop:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Oryza sativa"
/strain="oultivar Nipponbare, sub_species Japonica"
/db_xref="taxon:4530"
/clone="C53625"
/clone="C53625"
/clone="Yector: pBluescript II SK+; Site_1: SalI; Site_2:
NotI; cDNA prepared from rice callus mRNAs by using
oligo(dT) as a primer and ligating to the SalI-NotI site
of pBluescript II SK+ phagemid.
a 128 c 152 g 52 t
              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9.98;
48.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                            GI:6859522
                                                                                                  trimmed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 42.6; DB Pred. No. 0.23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .go
                                                                                                                                                                                          Rn.
                                                                                                    to exclude PolyA,
threshold for hig
                                                                                                                                                                                                                                                              version
                                                                                                                                                                                          2502,
                                                                                                                                                                                                                                                                                               light-grown
                                                                                                                                                                                                                                                                                                                   Marsala, C. and Pratt, L.H.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB
                                                                                                                                                                                          Athens,
                                                                                                                                                                                                                                                              replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29;
                                                                                                    highest
                                                                                                                                                                                                                                                                                                 seedlings
                                                                                                                                                                                          GA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 414;
                                                                                                                       vector and regions
                                                                                                                                                                                                                                                            gi:6677373
                                                                                                                                                                                          30602-7271,
                                                                                                    quality sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
```

```
RESULT
BE593608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
AUTHORS
BASE COUNT
ORIGIN
                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                              source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cccgttcagcgccacccgcggtccctcttccccgagttttctgagctgttcgcggccttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GAGGACCTGGACGACGCCGAGGTCGACGGCTTCCTCCCCGACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          atgaaagagggggctacgaggtacgcgcggagcttcccggggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccgtcattcgccggactccggcccaccttcgacacccggttgatgcggctggaagacgag 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCGGCCTTCCGCGACCGCTGGCTCCGCGAGTACGGCGCGCTCGGCCTGCTCGACGCCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCCGAGCAGCAGGAGGTGGACGTCTCCCCCCGAGTGGTGGCGCCTGGTCTCCGCCTCC 163
                                                                                                                                                                                                                                                                                   Email: mmpratt@uga.edu
Sequences have been trimmed
below Phred quality 16. The
                                                                                                                                                                                                                                                                                                                                                                        The University of Georgia Plant Sciences Building,
                                                                                                                                                                                                                                                                                                                                                                                                                              Unpublished (2000)
Contact: Cordonnier-Pratt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Sorghum.

1 (bases 1 to 389)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mRNA sequence.
BE593608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BE593608 389 1
WS1_98_G02.b1_A002
                                                                                                                                                                                                                                                   Seg primer: JEN REV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cordonnier-Pratt, M.-M., Gingle, A., Marsala, C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sorghum bicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EST
                                                                                                                                                                                                                                                                                                                                                                                                               Department of Botany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  An EST database from Sorghum:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sorghum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BE593608.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                56
                                                                                                                                                                                                                                 quality sequence stop:
                                                                                                                                                                                                                                                                                                                                           706 542 1860
706 542 1805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    42
           /Clone_lib="Water-stressed ] (WS1)"
/Clone_Torgan: Mix of 5-week old plants on days 7 & 8 after
water was withheld; Vector: Lambda Zap; Site_1: XhoI;
Site_2: EcoRI; The library was made from poly-A RNA in the
cloning vector lambda ZAP II. Clones to be sequenced were
prepared by mass excision."
a 129 c 153 g 51 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /Clone_lib="Light Grown 1 (LG1)"
/Clone_lib="Light Grown 1 (LG1)"
/note="Organ: 10- to 14-day-old light-grown (greenhouse)
seedlings; Vector: Lambda Zap; Site_1: XhoI; Site_2: EcoRI
: The library was made from poly-A RNA in the cloning
vector lambda ZAP II. Clones to be sequenced were
prepared by mass excision."
a 118 c 136 g 48 t
                                                                                                                                       /organism="Sorghum bicolor"
/db_xref="taxon:4558"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Sorghum bicolor"
/db_xref="taxon:4558"
                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9.7%;
53.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    dq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Water-stressed 1 (WS1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 41.8; DB Pred. No. 0.38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mRNA
                                                                                                                                                                                                                                                                                                                                                                              Rm.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                  ₹
                                                                                                                                                                                                                                                                                      to exclude threshold 1
                                                                                                                                                                                                                                                                                                                                                                            2502,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   water-stressed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DΒ
                                                                                                                                                                                                                                                                                                                                                                              Athens,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            77;
                                                                                                                                                                                                                                                                                        for
                                                                                                                                                                                                                                                                                                       PolyA, vector and regions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sorghum
                                                                                                                                                                                                                                                                                     highest quality
                                                                                                                                                                                                                                                                                                                                                                              GA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  plants
                                                                                                                                                                                                                                                                                                                                                                              30602-7271,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sudman,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18-AUG-2000
bicolor cDNA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                      sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0,
```

멍 Š Дb В δ δ

Ø

```
JOURNAL
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
BE552631
                         Qγ
                                                       밁
                                                                                 Ω<sub>γ</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                      ORIGIN
                                                                                                                                                                                                  BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Locus
                                                                                                                          Query Match
Best Local Similarity
                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                               source
392
                           115
                                                       332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           150 CCCGAGCAGGAGGTGGAGGACTTCTCCCCCGAGTGGTGGCGCCTGGTCTCCGCCTCC 209
                                                                                  55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13 cccgttcagcgccacccgcggtccctcttccccgagttttctgagctgttcgcggccttc
                atgoggctggaagacgagatgaaagagggggcgctacgaggtacgcggcggagcttcccggg 174
                                                                      atgaaagaggggcgctacgaggtacgcgcggagcttcccggggtc 177
CAGTGCCCCGTCACCAAGGGCTCAAGGGGTACAGGGATGAGGTCTTCGCGCTGATTCCCCAGC 451
                                                       GCGGAGGTCCAGGAGCTCGCGCCACTCGCCGGGGTCCGGGTCGAGTCGCTCGACCTGTTC 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccgtcattcgccggactccggcccaccttcgacacccggttgatgcggctggaagacgag 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAGGACCTGGACGACGCCGAGGTCGACGGCTTCCTCCCCGACGAC
                                                                                                              101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGGCCTTCCGCGACCGCTGGCTCCGCGAGTACGGCGCGCTCGGCCTGCTCGACGCCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Department of Biological Sciences
Stanford University
855 California Ave, Palo Alto, CA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Zea. 1 (bases 1 to 531)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Zea mays
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BE552631 531 bp
946082H01.yl 946 - ta
                                                                                                                                                                                                                                                                                                                                                                                                                            Email: walbot@stanford.edu
Plate: 946082 row: H colum
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Contact: Walbot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BE552631.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mays cDNA, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Maize ESTs from various
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Walbot,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     650 723 2227
650 725 8221
                                                                                                                                                                                                   72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                               /note="Organ: tassels; Vector: HybriZAP; Site_1: EcoRI Site_2: XhOI; George Chuck dissected immature tassels between Imm and 3mm. Sharon Stanfield prepared the clibrary in HybriZAP. Sample insert size range was 35 to 3 Kb with a 1 Kb average."
                                                                                                                                                                                                                                                                                    /dev_stage="just after the
inflorescence development"
/lab_host="XLOLR"
                                                                                                                                                                                                                                                                                                                                                                                   /organism="Zea mays"
/cultivar="OH43"
                                                                                                                                                                                                                                                                                                                               /tissue_type="tassels"
                                                                                                                                                                                                                                                                                                                                                        /db_xref="taxon:4577"
/clone_lib="946 - tas
                                                                                                                           9.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.7%;
53.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tassel
                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 41.8; DB 110;
Pred. No. 0.38;
0; Mismatches 77;
                                                                                                                          Score 41.6; DB
Pred. No. 0.44;
                                                                                                                                                                                                                                                                                                                                                                                                                                            column:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cDNA libraries
                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           primordium
                                                                                                                                                                                                                                                                                                                                                          tassel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CA
                                                                                                                                                                                                                                                                                                                                                                                                                                            01
                                                                                                                                                                                                                                                                                                                                                        primordium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   94304,
                                                                                                                                          DΒ
                                                                                                                                                                                                                                                                                                                transition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        prepared
                                                                                                               99;
                                                                                                                                          109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sequenced
                                                                                                               Indels
                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                        prepared
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bу
                                                                                                                                                                                                                                                                                                                  from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10-AUG-2000
Schmidt lab
                                                                                                                                           531;
                                                                                                                                                                                                                              range was 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                389;
                                                                                                                                                                                                                                                                                                                vegetative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Stanford
                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                        γd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                           Schmidt
                                                                                                                                                                                                                                                                       EcoRI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Zea
                                                                                                                                                                                                                                                                                                                   6
                                                                                                                                                                                                                              dq
                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0,
```

```
RESULT 1
BE584146
LOCUS
                                                                                                                                                              B
                                                                                                                                                                                            Qy
                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                            В
                                                                                                 밁
                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                         ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                       BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 1
AV388402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                                 247
                                                                                                                                 282
                                                                                                                                                               187
                                                                                                                                                                                                                               127
                                                                                                                                                                                                                                                              162
                                                                                                                                                                                                                                                                                                                            102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 175
                                                                                                                                                                                                                                                                                             67
                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                             cgacacccggttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcgc 161
                                                                                               GCAGGTCTGAGGTGTCCATGTGGTGGTGGAGGGCGGATGGNANGAGG
                                                                                                                       cggttccttcgttcgcacggtgtcgctgccggtaggtgctgacgagg 328
                                                                                                                                                              GGCGCTGGGCATGGAGCTGCAGGAGACCAAGAGCGCCGCCGCCCAGCTCCAAGGGCTTCAA
                                                                                                                                                                                                                              GCTGTCGGCGGCGAGGCCAGCGACGACGAGGAGCGGCTGGGCCGTGACGTGGAGGC
                                                                                                                                                                                                                                                          ggagcttcccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagct 221
                                                                                                                                                                                                                                                                                          CGACCCGCGCCTGGTGAGCCTGGACCAGGAGATGGCGGATCGCCCGACGACGCCGCCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gagcgcaccgagcagaagga 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  glogaccccgacaaggacglocacattalgglocgcgalggloagctgaccatcaaggcc
                                                                                                                                                                                          gaccatcaaggccgagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GACGACGAGGAGGACGA 531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTCAAGTACCTCCATGGCGCTGACGCTGAGGGCAACGAGCGTTTGGAGACGGATGACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AV388402 294 bp
AV388402 Chlamydomonas r
CDNA clone CM033b05_r, m
AV388402 GI:6542618
BE584146 667 bp n
9-8F-HA PsojaeHA Glycine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EST.
Chlamydomonas reinhardtii.
Chlamydomonas reinhardtii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Asamizu,E., Nakamura,Y., Sato,S., Fukuzawa,H. and Tabata,S. A large scale structural analysis of cDNAs in a unicellular green alga, Chlamydomonas reinhardtii. I. Generation of 3433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The First Laboratory for Plant Gene Research Kazusa DNA Research Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Contact: Yasukazu Nakamura
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    non-redundant expressed sequence tags DNA Res. 6 (6), 369-373 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Chlamydomonadaceae; Chlamydomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Viridiplantae; Chlorophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 294)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1532-3, Kisarazu, Chiba 292-0812, Japan
l: ynakamu@kazusa.or.jp, URL:http://www.kazusa.or.jp/en/plant/.
                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                        54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       XhoI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /clone_lib="Chlamydomonas reinhardtii C9"
/dev_stage="photoautotrophic growth"
/note="Vector: pBluescriptII SK-; Site_1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Chlamydomonas/strain="C9"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /clone="CM033b05_r"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="taxon:3055"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                         9.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        86
                                                                                                                                                                                                                                                                                                                                                                                                                                                        O
                                                                                                                                                                                                                                                                                                                                                                                                                                                     118 g
                                                                                                                                                                                                                                                                                                                                                                         Score 41;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  reinhardtii C9
                  mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   mRNA
                                                                                                                                                                                                                                                                                                                                                          Mismatches
max/Phytophthora
                                                                                                                                                                                                                                                                                                                                                                         0
                                                                                                                                                                                                                                                                                                                                                                                                                                                        34 t
                                                                                                                                                                                                                                                                                                                                                                                       DB 36; Length 294;
                                                                                                                                                                                                                                                                                                                                                                         .61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     reinhardtii
                                                                                                                                                                                                                                                                                                                                                        117;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Chlamydomonas reinhardtii
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Chlorophyceae;
sojae mixed
                                                                                                                                                                                                                                                                                                                                                                                                                                                     2 others
                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EcoRI; Site_2:
                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Volvocales;
                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                              281
                                                                                                                                                                                                                              186
                                                                                                                                                                                                                                                                                            126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  511
                                                                                                                                                              246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234
                                                                                                                                                                                                                                                                                                                                                        0;
```

```
δõ
                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE
COMMENT
                                         δõ
                                                                                      Вb
                                                                                                                           Qy
                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity 45.9
Matches 146; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
    269
                                                                                                                                                                      149
                                                                                                                                                                                                             221
                                                                                                                                                                                                                                                                                               161
                                                                                                                                                                                                                                                                                                                                                                               101
                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                        29
                                                                                                                                                                                           tgaccatcaaggccgagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgt 280
                                                                                                                                                                                                                                                                              cggagcttcccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagc 220
                                                                                                                                                                                                                                                                                                                                                             tcgacacccggttgatgcggctggaagacgagatgaaagagggggcgctacgaggtacgcg 160
                                      ccacctacgacaagggcattcttactgtgtcggtggcggtttcggaagggaagccaaccg 400
                                                                                                              acggttccttcgttcgcacggtgtcgctgccggtaggtgctgacgaggacgacattaagg
                                                                                                                                                                                                                                                                                                                                    TCGACCACGCGCTGCGGGGGGGGGGTGACTTCCTGAACAAGGTCACCCGCAGCTTCCGTG
ACTTCATGAAGCAGCTCAAGGCCGAGATCTCGAAAGAGGACTCGCTAAAGAAGCTGACCA
                                                                                    AGAAGGTGCTCGTGTTCATGGACGGTCTGTTCGATGATGCGACCAAGCAGTTCCGTGCTG
                                                                                                                                                                      CGGCCAAGAAGCCCACGCACGCAGGTGTACCTGACCACGGAGTTCCCCGGAGTGGCAGC
                                                                                                                                                                                                                                                    AGGCGCTTGCCAAGAGCGGCAACAAGAAGAAGGGCCAAGAAGGGCGCTGCTGCTGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qutob,D., Hraber,P.T., Sobral,B.W.S. and Gi:
Comparative analysis of expressed sequences
Plant Physiol. 123 (1), 243-254 (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1391 Sandford Street,
Tel: 519 457 1470
Fax: 519 457 3997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Glycine max/Phytophthora sojae mixed Glycine max/Phytophthora sojae mixed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cDNA, mRNA sequence
BE584146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Agriculture and Agri-Food Canada
1391 Sandford Street, London. On
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BE584146.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Transcript obtained
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Email: gijzenm@em.agr.ca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Contact: Gijzen M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; mixed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 667)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        host strain XLOLR. Se
CCT CAC TAA AGG GA 3'.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      coli host strain XL1 Blue MRF'. Inserts were then subcloned by mass excision using ExAssist helper phage for conversion into phagemid vector pBK-CMV in E, coll host strain XLOLE. Sequenced using T3 primer: 5' ATT AAC CCT CAC TAA AGG GA 3'."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 with XhoI for directional cloning into lambda ZAP Expression. This lambda library was amplified once using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        synthesized from mRNA using an XhoI-poly(dT) linker-primer. EcoRI adapters were ligated to the blunt-ended cDNA fragments and the products were digested
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cDNA library was constructed from polyA+ enriched mRNA from eticlated hypocotyls 48 h post-inoculation with Phytophthora sojae zoospores. Complementary DNA was
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /dev_stage="8 d old etiolated hypocotyls 48 post-inoculation with Phytophthora sojae zoo/lab_host="E. coli strain XLOLR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Phytophthora sojae zoospores.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /cultivar="Glycine max cultivar Harosoy
/db_xref="taxon:135715"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Vector: pBK-CMV; Site_1: EcoRI; Site_2: XhoI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /tissue_type="Plant hypocotyls infected with Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /clone_lib="PsojaeHA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /strain="Phytophthora sojae race 2 strain P6497"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    organism="Glycine max/Phytophthora sojae mixed EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GI:9835095
                                                                                                                                                                                                                                                                                                                                                                                                                                       9.5%;
45.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EST libraries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                from mixed plant-pathogen
                                                                                                                                                                                                                                                                                                                                                                                                                   Score 41; DB Pred. No. 0.64
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       London, Ontario,
                                                                                                                                                                                                                                                                                                                                                                                                                   DB 110;
0.64;
hes 175;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           and Gijzen,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Canada
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 667;
                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  into lambda ZAP Express
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sojae zoospores"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    interaction culture
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Phytophthora
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4T3
                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                           340
                                                                                                                                                                    208
                                                                                                                                                                                                                                                      148
                                                                                                                                                                                                                                                                                                                                      88
                                                                                  268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sojae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This
                                                                                                                                                                                                                                                                                                                                                                                                                      0;
```

γ

```
08
                                                                              Qy
                                                                                                                      В
                                                                                                                                                        Ş
                                                                                                                                                                                             B
                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                     Ъ
                                                망
                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 1
BE558685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                                                                                                                                                            Matches 148;
                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                UTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                        E COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
               307
                                                  315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          329
                                                                                  247
                                                                                                                                                           187
                                                                                                                                                                                                 195
                                                                                                                                                                                                                                 127
                                                                                                                                                                                                                                                                       135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               401 aaaagcacattcagatccggt
                                                                                                                                                                                                                                                                                                        67
                                                                                                                                                                                                                                                                                                                                                               Local Similarity
           ctgccggtaggtgctgacgacgacattaaggccacctacgacaagggcattcttact 366
                                                                                                                                           aaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgcaccgag 246
                                                                                                                                                                                                                                                                                           gccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcggctggaa 126
                                                                                GAGGAGGAGGACGACGCCGATCTCGAAGCCGCCGCCCGAGGGGGATCTCCGAC
                                                                                                                                                                                                                             gacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccggggtcgaccccgac 186
                                                                                                                                                                                                                                                                     GCCTCCGCGTCCGCCGTGCTCGCCCACCTCGCCGGCGGCAACAGCTGGCACGCCGAGGAC 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGAACGTGATGCAAGTTCGCT 349
                                                CGCACAGCAGCGGCAGACCGACGAAATCGAGGAGCACGATGCTCAGACCACCGACGAT
                                                                                                                      CTGTACGACCTCATCGTCGGCCTCCAGGCCGCCGGCCGTCCAAGGCCGAAGACGCCGAT 314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Clemson University
100 Jordan Hall, Clemson,
Tel: 864 656 7288
Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Wing,R., Close,T.J., Kleinhofs,A., Wise,R., Begum,D., Frisch,D., Y., Anderson,H., Dale,J., Henry,D., Kernodle,S., Palmer,M., Rambo,T., Saski,C., Schwartzbeck,J., Simmons,J., Choi,D.W., Main,D. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for barley genomics Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BE558685 803 bp mRNA EST HY_CED0020804f Hordeum vulgare seedling green leaf EST library HV_CDNA0005 (Eryslphe infected & control) Hordeum vulgare cDNA clone HV_CED0020B04f, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Email: rwing@clemson.edu
Seg primer: AATTAACCCTCACTAAAGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Hordeum.

1 (bases 1 to 803)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Clemson University Genomics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Development of a genetically and physically anchored
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wood, T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hordeum vulgare
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          BE558685.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BE558685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        barley.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         169
                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        quality sequence start: 6 quality sequence stop: 590.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Hordeum vulgare"
/cultivar="C116151 (M1a6)"
/db_xref="taxon.4613"
/clone="HV_CEb0020B04f"
/clone=lib="Hordeum vulgare seedling green leaf
library HVCDNA0005 (Erysiphe infected & control)
/tissue_type="seedling green leaf"
/tissue_type="seedling green leaf"
/hab_host="SUR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GI:9823175
                                                                                                                                                                                                                                                                                                                                                             9.4%;
45.3%;
                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                             Score 40.6; DB Pred. No. 0.82;
                                                                                                                                                                                                                                                                                                                                            Mismatches 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29634, USA
                                                                                                                                                                                                                                                                                                                                                                                DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      infected & control)"
leaf"
                                                                                                                                                                                                                                                                                                                                                                                109;
                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                803;
                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EST resource
                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                             254
                                                                                                                                                                                                                                                                                                                                            0
```

δõ

73 64 Ωy

13 cccqttcagcgccacccgggtccctcttccccgagttttctgagctgttcgcggccttc 72 CCCGAGCAGCAGGAGGTGGACGTCTCCCCCGAGTGGTGGCGCCCTGGTCTCCGCCCTCC 123 ccgtcattcgccggactccggcccaccttcgacacccggttgatgcggctggaagacgag 132

Query Match Best Local Similarity

Matches

87;

Conservative

0,

Mismatches

78;

Indels Length

Gaps

0

Score 40.2; Pred. No. 1;

DΒ

377; 0;

В

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BE595391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                           ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    435 ATCGCGCTCGAGTTCTCCGACGGGGAG 461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           375 GTCGACGAGGAGGAGGAGGAGGACGACGGGTTCTGCGTGGTGCGGGGCATCACC 434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gtgtcggtggcggtttcggaagggaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The University of Georgia
Plant Sciences Building, Rm.
Tel: 706 542 1860
Fax: 706 542 1805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Seq primer: JEN REV
High quality sequen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequences have been trimmed to exclude PolyA, vector and regions below Phred quality 16. The threshold for highest quality sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Email: mmpratt@uga.edu
Sequences have been tri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unpublished (2000)
Contact: Cordonnier-Pratt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Sorghum.
1 (bases 1 to 377)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mRNA sequence.
BE595391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE595391 377 N
PI1_53_F11.b1_A002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POLYA-No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Department of Botany
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cordonnier-Pratt,M.-M., Gingle,A., Dean,R., Sudman,M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sorghum bicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BE595391.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               is 20.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          An EST database from Sorghum: pathogen-induced plants
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sorghum
                                                                                                                  47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              quality sequence stop:
                                                                                                                                                                        two-week-old sorghum plants 48 hr after inoculation;
Vector: pBluescript II from Lambda Zap II; Site_1: XhoI;
Site_2: EcoRI; Two-week-old sorghum plants (BTX 623
Cultivar) were infected with pathogen (isolate FRMAI) of
Colletotrichum graminicola, which is a sorghum isolate).
RNA was prepared from infected leaves harvested from 45
seedlings 48 hours after inoculation. Note: young
seedlings 48 hours after inoculation. Note: young
seedlings (2 weeks old) exhibit juvenile resistant 4
reaction, which is an incompatible interaction. As they
grow older (4 weeks or older), plants resume susceptiblity
to anthracnose disease. The library was made from poly-A
RNA in the cloning vector lambda ZAP II. Clones to be
sequenced were prepared by mass excision. WARNING: While
most or all ESTs are expected to derive from the host
                                                                                                                                     plant, no effort was made to eliminate ESTs deriving from the pathogen." % \label{eq:encoder}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="taxon:4558"
/clone_lib="Pathogen induced 1 (PI1)"
/note="Organ: Anthracnose-infected leaves from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Sorghum bicolor"
9.38;
52.78;
                                                                                                                pathogen.
126 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bp пким
)2 Pathogen
                                                                                                              153 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               threshold for highest quality sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 induced 1 (PI1) Sorghum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2502,
                                                                                                                  51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Athens,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                30602-7271,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      18-AUG-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDNA,
```

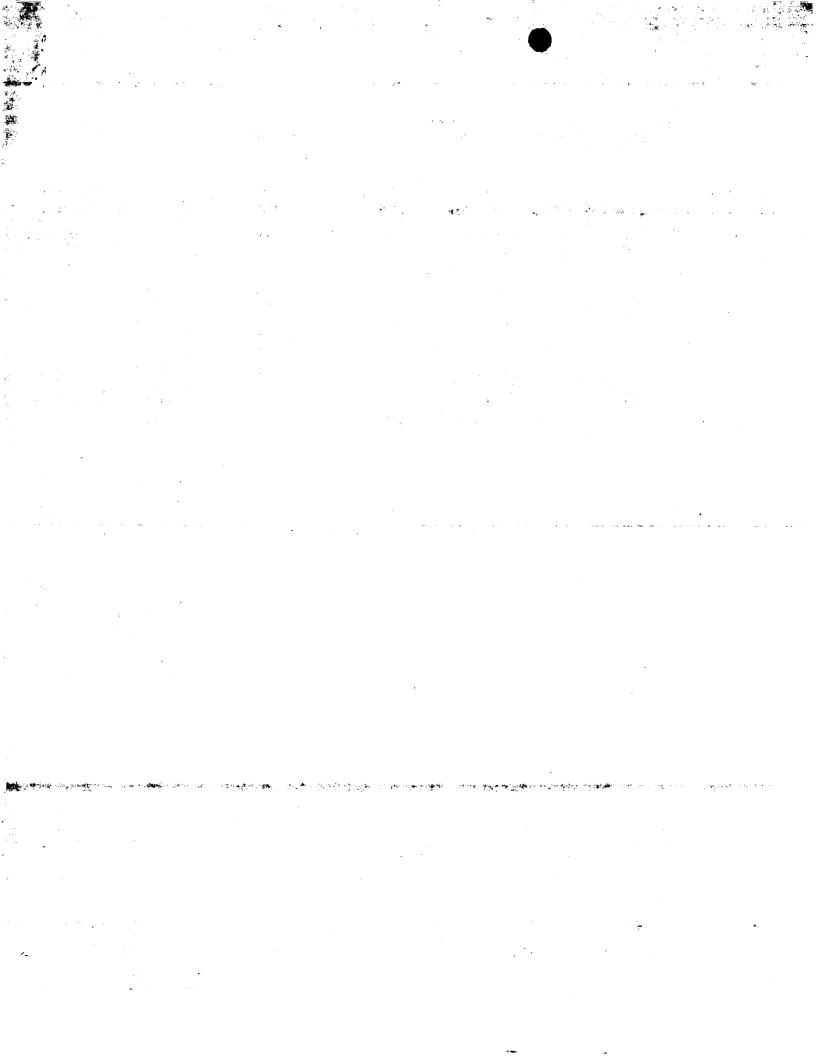
Ó

```
ACCESSION
VERSION
                                                                   RESULT 1
BE387312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 14
AW091035/c
                                                       LOCUS
                                                                                                                         В
                                                                                                                                                 QΥ
                                                                                                                                                                              Ър
                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                    Вр
                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                          DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LOCUS
                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                      Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
                                                                                                                                                                               446
                                                                                                                           386
                                                                                                                                                    355
                                                                                                                                                                                                                                                                 235
                                                                                                                                                                                                            295
                                                                                                                                                                                                                                   506 GAGCAGGAGGAGACGGACACCTGGCTCCGCGTGGAGCGGAGCAGCGGGGGGTTCCTG 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 184 GAGGACCTGGACGACGCCGAGGTCGACGGCTTCCTCCCCGACGAC 228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        124
                                                                                                                                         ggcattcttactgtgtcggtggccggtttcggaagggaagccaaccgaaaagca 407
                                                                                                                                                                                               cgcacggtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaag 354
                                                                                                                                                                                                                                                      gagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgtacggttccttcgtt 294
                                                                                                                        GGCGTGCTTACAGTCACTGTGCCGAAGGAGGACGCCAAGAAGCCTGAAGTGAA 334
                                                                                                                                                                              CGCAGGTTCCGGCTGCCCGAGAACGCCAAGACGGAGCAGATCACGGCCGCCATGGAGAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCGGCCTTCCGCGACCCCTGCCTCGAGAGTACGCCGCCTCGCCTCGACCCCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     atgaaagagggcgctacgaggtacgcgcggagcttcccggggtc
BE387312 684 bp
601275760F1 NIH_MGC_20 H
mRNA sequence.
BE387312
BE387312.1 GI:9332677
                                                                                                                                                                                                                                                                                           90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  855 California Ave, Palo Alto, CA 94304, USA
Tel: 650 723 2227
Fax: 650 725 8221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Zea mays
Eukaryota; Viridiplantae; E
Magnoliophyta; Liliopsida;
L (bases 1 to 613)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AW091035.1
EST.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     mRNA sequence.
AW091035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AW091035 613 k
614070A12.y1 614 -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Stanford University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Contact: Walbot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Unpublished (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Walbot, V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Plate: 614070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Department of Biological Sciences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Maize ESTs from various
                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                           145
                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  walbot@stanford.edu
                                                                                                                                                                                                                                                                                                                                                                           Ω
                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="taxon:4577"
/clone_lib="614 - root cDNA library from Walbot Lab"
/tissue_type="root",
/dev_stage="3-4 days old"
/lab_host="XLOLR"
                                                                                                                                                                                                                                                                                                                                                                                                  /note="Organ: root; Vector: pBlueScriptII SK+; EcoRI; Site_2: XhoI; 3-4 days old root tissue !
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Zea mays"
/cultivar="W23"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1070 row: A column coation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . .613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GI:6056630
                                                                                                                                                                                                                                                                                                                                                                                         ( LM) "
                                                                                                                                                                                                                                                                                                                                                                           183 c
                                                                                                                                                                                                                                                                                                      9.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  root
                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                        Score 40.2; DE Pred. No. 1; 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                         131 g
                                         Homo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        column:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cDNA libraries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              mRNA
cDNA library
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Embryophyta; Tracheophyta; Poales; Poaceae; Zea.
                                        sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12
                                                                                                                                                                                                                                                                                                                                                                           153 t
                                                                                                                                                                                                                                                                                                                     DB
                                         CDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               from
                                                                                                                                                                                                                                                                                         83;
                                                                                                                                                                                                                                                                                                                   39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sequenced
                                        EST 21-JUL-2000 clone IMAGE:3616574 5',
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Walbot
                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                  Length 613;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lab
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Stanford
                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Zea mays
                                                                                                                                                                                                                                                                                                                                                                                                                  Site_1:
                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       183
                                                                                                                                                                                                                                                                                                                                                                                                     Walbot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDNA
                                                                                                                                                                                                                                                                                         0;
```

Search completed: January 12, Job time: 21237 sec

2001, 18:01:41

```
Вþ
                                                                                                                         Ω
                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                             В
Ъ
                                        Qy
                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                    QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source
                                                                                     417
                                                                                                                                                                                                 148 tacgaggtacgcgcggagcttcccggggtcgaccccgacaaggacgtccacattatggtc 207
  477
                                                                                                                                                                                                                                                             297
                                          268
                                                                                                                                208
                                                                                                                                                                      357 CGGGCGCTGATCGAGGAGCGGGGCCGCTTCTGCACCTTCATCACCTTCCTGCAGCCTGTG 416
                                                                                                                                                                                                                                                                                    88 ctccggcccaccttcgacacccggttgatgcggctggaagacgagatgaaagaggggcgc 147
                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                              CTGCAGGACGTCAACGACATGTACCTGCTGCTGGAGGAGGACGGAGAAGCAGGCCGTGCGC 356
TTGG
                                        tcgg 271
                                                                                                         cgcgatggtcagctgaccatcaaggccgagcgcaccgagcagaaggacttagacggtcgc 267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Tissue Procurement: ATCC/DCTD/DTP
CDNA Library Preparation: Ling Hong/Rubin Laboratory
cDNA Library Arrayed by: The I.M.A.G.E. Consortium (LLNL)
DNA Sequencing by: Incyte Genomics, Inc.
Clone distribution: MGC clone distribution information can
found through the I.M.A.G.E. Consortium/LLNL at: image.llnl.
Plate: LLCM282 row: h column: 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 High quality sequence start: 71 High quality sequence stop: 681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unpublished (1999)
Contact: Robert Strausberg,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NIH-MGC http://www.ncbi.nlm.nih.gov/MGC/.National Institutes of Health, Mammalian
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; 1 (bases 1 to 684)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Email: Robert_Strausberg@nih.gov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (301) 496-1550
                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Homo.sapiens"
//db_xref="taxon.9606"
//clone="IMAGE:3616574"
//clone_Iib="NIH_MGC_20"
//tissue_type="melanotic melanoma"
//lab_host="PH10B (phage-resistant)"
//note="Organ: skin; Vector: pOTB7; Site_1: XhoI; Site_2:
ECORI; cDNA made by oligo-dT priming. Directionally
cloned into EcoRI/XhoI sites using the following 5;
adaptor: GCACGAG(G). Size-selected >500bp for average
insert size 1.8kb. Library constructed by Ling Hong in
the laboratory of Gerald M. Rubin (University of
California, Berkeley) using ZAP-cDNA synthesis kit
(Stratagene) and Superscript II RT (Life Technologies)."
70 a 205 c 186 g 122 t 1 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                     9.3%;
51.1%;
                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                              Score 40; DB Pred. No. 1.2; 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        column: 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ph.D
                                                                                                                                                                                                                                                                                                                                                                                       107;
                                                                                                                                                                                                                                                                                                                                              90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gene Collection (MGC)
                                                                                                                                                                                                                                                                                                                                                                                       Length 684;
                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Euteleostomi;
                                                                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Homo
                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .gov
                                                                                                                                                                                                                                                                                                                                              0;
```



OM nucleic - nucleic search, using sw model

GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.

January 12, 2001, 20:14:13; Search time 153.29 Seconds (without alignments) 454.180 Million cell updates/sec

```
STRANDEDNESS: single;
TOPOLOGY: linear;
MOLECULE TYPE: cDNA
PCT-US95-04801-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 1
PCT-US95-04801-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    00
                                                                                             TELEPHONE: (908) 594-3905
TELEFAX: (908) 594-4720
INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
LENGTH: 972 base pairs
TYPE: nucleic acid
GTPANDEDNESC: cialo
Query Match
Best Local Similarity
Matches 121; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 2, Application PC/TUS9504801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION:
NAME: Wallen III, John W.
REGISTRATION NUMBER: 35,403
REFERENCE/DOCKET NUMBER: 19:
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                            CURRENT APPLICATION DATA: APPLICATION NUMBER: PC'
                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION: DNA ENCODING CEPHAMYCIN BIOSYNTHESIS
TITLE OF INVENTION: LATE GENES
NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                           STREET: P.O. CITY: Rahway STATE: New Je
                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTMARE: Patentin Release #1.0, Version
                                                                                                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                        COUNTRY: UZIP: 07065
                                                                                                                                                                                                                                   FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                               ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                P.O. Box
                                                                                                                                                                                                                                                                                                                                   USA
                                                                                                                                                                                                                                                                                                                                                                                                                                 Enguita, Francisco J.
Fuente, Juan L.
Llarena, Francisco J.
Liras, Paloma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Martin, Juan R
Coque, Juan R
  Conservative
                                                                                                                                                                                                                                                                                                                                                                   John W. Wallen III
O. Box 2000
                                                                                                                                                                                                                                                                                                                                              Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1450
1450
20235
20235
20235
1052
1052
38506
285
1334
30001
43280
           9.18;
47.18;
                                                                                                                                                                                                                                            PCT/US95/04801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-348-965-16
US-08-465-966-16
US-07-923-6922-5
US-08-184-237-5
US-08-482-920-5
US-08-484-341-5
US-07-642-734C-3
US-08-439-009A-3
US-08-439-009A-3
US-08-439-009A-3
US-08-510-646B-10
US-09-320-878-19
5244792-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-916-901-2
US-08-125-468-1
US-08-474-933-1
US-08-804-227C-1
 0;
           Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ALIGNMENTS
 Mismatches
           39.4; DB
No. 0.06;
 136;
                 4.
                    Length 972;
 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 10, Appl
Sequence 10, Appl
Sequence 19, Appl
Sequence 19, Appl
Patent No. 5244792
Sequence 2, Appli
Sequence 1, Appli
Sequence 1, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5, Appli
5, Appli
5, Appli
5, Appli
3, Appli
3, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16,
16,
Gaps
 0;
```

Minimum Maximum

DB DB

seq

length: 0 length: 2000000000

Searched:

tal number of hits satisfying chosen parameters:

561672

280836 seqs, 80580151 residues

Scoring table: Sequence: Perfect score: Title:

Gapop 10.0 ,

Gapext 1.0

IDENTITY_NUC

US-09-461-774-7

1 gccaccacccttcccgttca....agatccggtccaccaactga 432

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Issued_Patents_NA:*

1: /cgn2_6/ptodata/1,

2: /cgn2_6/ptodata/1,

3: /cgn2_6/ptodata/1,

4: /cgn2_6/ptodata/1,

5: /cgn2_6/ptodata/1,

/cgn2_6/ptodata/1/ina/5A_COMB.seq:*
/cgn2_6/ptodata/1/ina/5B_COMB.seq:*
/cgn2_6/ptodata/1/ina/5CTUS_COMB.seq:*
/cgn2_6/ptodata/1/ina/backfiles1.seq:*

and is

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed,

derived by analysis of the total score distribution.

SUMMARIES

24 25 27 28	18 19 20 c 21 c 22 c 23	C 117 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Result
	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3		Score
7.8 7.8 7.8 7.8		17.888888888888999 10.00011133344448809	% Query Match Length
917 970 970 970 44377 44377	620 620 620 620	972 4897 1108 3231 3231 1482 1800 1800 1800 1800 1800 2634 1785 2634 1785 1785 1785	
22412	000000	4541488118411666	DB
US-08-951-822-1 US-08-250-030-1 PCT-US95-06790-1 US-08-804-227C-7 US-08-804-198-1	US-08-757-653-135 US-08-757-653-136 US-08-757-653-137 US-08-757-653-138 US-08-757-653-138 US-08-757-653-139	PCT-US95-04801-2 5195516-7 PCT-US93-03035-1 US-08-074-121-4 PCT-US94-06447-4 US-08-660-645A-6 US-08-260-202A-10 US-08-107-114-10 US-08-105-307-10 PCT-US94-02034-10 US-08-106-218-31 US-08-101-856-1 US-08-910-856-1 US-08-910-856-1 US-08-910-856-1 US-08-910-856-1 US-08-910-856-1 US-08-910-856-1 US-08-910-856-1	ID
Sequence 1, Appli Sequence 1, Appli Sequence 1, Appli Sequence 7, Appli Sequence 1, Appli	Sequence 135, App Sequence 136, App Sequence 137, App Sequence 138, App Sequence 139, App Sequence 140, App	2 A A A A A A A A A A A A A A A A A A A	Description

δÃ

120 gctggaagacgagatgaaagaggggcgctacgaggtacgcggggggcttcccgggggtcga 179

```
PADALO., 5196516
; PATENT O., 5196516
; APPLICANT: SCHREURS, CHRISTA S.; METTENLEITER, THOMAS
; SIMON, ARTUR J.; LUKAS, NOEMI; RZIHA, HANNS J.
; TITLE OF INVENTION: PSEUDORABIES VIRUS VACCINE
; NUMBER OF SEQUENCES: 8
; CURRENT APPLICATION NUMBER: US/07/383,833
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                         PCT-US93-03035-1
                                                                                                                                                                                                                                                                                                         RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5196516-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: US/
FILING DATE: 21-JUL-1989
:SEQ ID NO:7:
                                                                                                               Sequence 1, Application PC/TUS9303035
GENERAL INFORMATION:
AAPPLICANT: ABBOTT LABORATORIES
TITLE OF INVENTION: PURIFIED THERMOSTABLE ENDONUCLEASE
NUMBER OF SEQUENCES: 2
CORRESPONDENCE ADDRESS:
ADDRESSEE: ABBOTT LABORATORIES
STREET: D-377 AFGD, ONE ABBOTT PARK ROAD
CITY: ABBOTT PARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ULT :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                              3465 tgtccatcgtgtcggccctcgagcagcaggagcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3345 gtcgcaaccccatgaaggccctgtaccccgtcacgacgaagacgctcaaggaggacggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                        3405 togacgagggcgacgtggacgaggccaagctggaccaggcccgggacatgatccggtaca 3464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3285 tgctggtgctggccggcctggtcgcggccttcctggcctaccggcacatctcgcgcctgc 3344
                                                                                                                                                                                                                                                                                                                                                                               221 tgaccatcaaggccgagcgcaccgagcagaaggac 255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           161 cggagcttcccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagc 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     285 CATGTCGTACTCGATGG 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     165 CACGGCCGAGGAGGAGGCCGTGACCACGAAGGTCCCGACCATGCGGCGCGGGTACTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              41 teceogagitttetgagetgitegeggeetteeegteattegeeggaeteeggeeeacet 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity nes 105; Conserv
                                                                              COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 4897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tcgacacccggttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcg 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tettactgtgteggtgg 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggtgtcgctgccggtaggtgctgacgaggacgaccattaaggccacctacgacaagggcat 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGCGCTGGAGGCGGAAAGCACCGCCCAGGTCACCAACACCGGCACCTACACCGACTACTC 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CGCCACCGAACGAGCCACCGGGTGGCCACCGACACCGCGATGGACTTCTTCGCCCAAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCGCCAGGACGAGTTCCGCGAGTGGGCCCGCCGCGGGGTCTTCTACCTCACCGGGTACGG 104
                                                            60064-3500
                                                                                               ILLINOIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9.0%;
48.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 39; DB 5
Pred. No. 0.11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 5; Length 4897;
                                                                                                                                                                                                                                                                                                                                                                3499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                          US-08-074-121-4
                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PCT-US93-03035-1
                                                                                                                                                                                                                             Sequence 4, Application US/08074121
Patent No. 5767362
PATENT NEFORMATION:
APPLICANT: Best, Elaine
APPLICANT: Knauf, Vic C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: US/07/
FILING DATE: 16-APR-1992
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/07/
FILING DATE: 31-MAR-1992
ATTORNEY/AGENT INFORMATION:
NAME: BRAINARD, THOMAS D
   COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                      TITLE OF INVENTION: Methods and Compositions for Modulating TITLE OF INVENTION: Lipid Content of Plant Tissues NUMBER OF SEQUENCES: 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLASSIFICATION:
CLASSIFICATION DATA:
PRIOR APPLICATION NUMBER: US/07/869,306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE CHARACTERISTICS:
LENGTH: 1108 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE/DOCKET NUMBER: 53
TELECOMMUNICATION INFORMATION
TELEPHONE: 708-937-4884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: PatentIn Rel
CURRENT APPLICATION DATA:
                                                                                                                                                      CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                     415 GGGTGGAGTACGTGGTCGTCCACCCCGGGCTCGGGCCGCCCCGAGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  143
                                                                            STREET: 2200
CITY: Menlo Park
                                                                                                                                                                                                                                                                                                                                                                                                                          203 tggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcag 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               355 AGCTTTGGGAGAAGAGCGTGGCGAGCCTGGCGACCTTGGAGAAGGCCGCCCTCCTCG 414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       295 CCGGGGGCCTCCCCGCCGTGATCCACGCCTCCTACCTGGTCAACCTGGGGGGCGGAGGGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                235 GGCGCCCAAGGGCCCTCTCCCCGGCCGAGGTGGAGGCCTTCCGCGCCTTAAGGGAA;GCCT 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEPHONE: ///
TELEPHONE: /00-
708-937-2623
                                       COUNTRY: UZIP: 94025
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     23 gccacccgcggtccctcttccccgagttttctgagctgttcgcgggccttcccgtcattcg 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER:
                                                                                                                 ADDRESSEE: Fish & Richardson STREET: 2200 Sand Hill Road, Suite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRANDEDNESS:
TOPOLOGY: ci:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggcgctacgaggtacgcggaggttcccggggtcgaccccgacaaggacgtccacatta 202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccggactccggcccaccttcgacacccggttgatgcggctggaagacgagatgaaagagg 142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUCLEIC ACID
                                                                              California
                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  circular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        114..926
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA (genomic)
Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19930330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8.8%;
48.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/07/860,702
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PCT/US93/03035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      32,459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 38.2; DB Pred. No. 0.13; 0; Mismatches 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5145.PC.01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          118;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                     461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
```

Gaps

0

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                         PCT-US94-06447-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-08-074-121-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Loc
Matches
                                                                                                                                                                                                                                                                                        Sequence 4, Application PC/TUS9406447 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELEFAX: (415) 854-0875
TELEX: 200154
INFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                        APPLICANT: Calgene, Inc.
APPLICANT: Calgene, Inc.
TITLE OF INVENTION: Methods and Compositions for Modulating
TITLE OF INVENTION: Lipid Content of Plant Tissues
NUMBER OF SEQUENCES: 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOFTWARE: Patentin Rel
CURRENT APPLICATION DATA:
                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                1946 CTGGAGAAGTTCCTGACCAACCCGCGCGCGCGAGTGCAAGTCCAGGTGCTTTCCGA---CGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1886 AAGTCGGCCAAGCTGACCCGCACCGAGGCCGGCGCGCGTTCGGCAACCCGATGGTCTAC
                                                                                                                                                                                                    NUMBER OF SEQUENCES: 1:
                                                                                                                                                                                                                                                                                                                                                                                                2003 CAGGGCAACGCCATCCACCTCGGCGACCGGCGACTGCTCCCTG 2044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1826 GCCGCCGGCGGCGCGTGGGCGCGCATGCGCGTGTCTACGACGAGTCCGAGCTGATC 1885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE: (415) 854-5277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121 ctggaagacgagatgaaagagggcgctacgaggtacgcgcgggagcttcccgggggtcgac
          MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Palana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEPHONE: (415) %54-0875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61 ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REGISTRATION NUMBER: 32,750
REFERENCE/DOCKET NUMBER: 05938/043001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: FILING DATE: 08-JUN
                                                                                                                      COUNTRY:
                                                                                                                                       STATE:
                                                                                                                                                      CITY: Menlo Park
                                                                                                                                                                        STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME: Rae-Venter, Barbara REGISTRATION NUMBER: 32,7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC OPERATING SYSTEM:
                                                                                                                                                                                      ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity les 113; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                      cccgacaaggacgtccacattatggtccgcgatggtcagctg
                                                                                                    94025
APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nucleic acid
                                                                                                                                    California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3231 base pairs
                                                                                                                                                                    E: Weil, Gotshal & Manges
2882 Sand Hill Road, Suite 280
                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
861..1328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PatentIn Release #1.0,
                PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
1349..2695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IBM PC compatible YSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08-JUN-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US/08/074,121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 36.4; DB 1;
Pred. No. 0.49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Version #1.25
                Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 3231;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1;
```

```
망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                US-08-660-645A-6
                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PCT-US94-06447-4
                                                                                                                                                                                                                                                                                                                                                               Sequence 6, Application US/08660645A Patent No. 6087152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INFORMATION FOR SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                           APPLICANT: APPLICANT:
                                                                                                                                                                                                         APPLICANT: Tessier, Michel
APPLICANT: van Loon, Adolphus
TITLE OF INVENTION: FERMENTATIVE CAROTENOID PRODUCTION
NUMBER OF SEQUENCES: 47
CORRESPONDENCE ADDRESS:
            MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1826 GCCGCCGGCGGCGGCGGCGCGCGCGCGTGCTCTACGACGAGTCCGAGCTGATC 1885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2003 CAGGGCAACGCCATCCACCTCGGCGACCGCGACTGCTCCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
LENGTH: 3231 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REFERENCE/DOCKET NUMBER: CG
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                     STREET: 340 K
CITY: Nutley
STATE: NJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121 ctggaagacgagatgaaagagggcgctacgaggtacgcgcggagcttcccggggtcgac 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181 cccgacaaggacgtccacattatggtccgcgatggtcagctg 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY:
                                                                                                                     COUNTRY: USA
ZIP: 07110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61 ttcgcggccttcccgtcattcgccggactccggcccaccttcgacaccccggttgatgcgg 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: FILING DATE: 06-JUN CLASSIFICATION:
                                                                                                                                                                       ADDRESSEE: HOLLHALL STREET: 340 Kingsland Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE: (415) 926-6200
TELEPAX: (415) 854-3713
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME: Rae-Venter, Barbara REGISTRATION NUMBER: 32,7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 gccaccaccettcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CTGGAGAAGTTCCTGACCAACCCGCGCGCCACGTGGAAGTCCAGGTGCTTTCCGA----CGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nucleic acid
                                                                                                                                                                                                                                                                                                              Pasamontes,
                                                                                                                                                                                                                                                                                                                             Hohmann, Hans-Peter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
861..1328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
1349..2695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               06-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8.4%;
50.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PCT/US94/06447
US/08/660,645A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       32,750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGNE-097/WO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0; Mismatches 106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 36.4; DB 4; Length 3231; Pred. No. 0.49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ω
``
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2002
```

07-JUN-1996

```
Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-298-718-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELEFAX: (201) 235-2363
INFORMATION FOR SEQ ID NO: (
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                     MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                  CLASSIFICATION: PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                         COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: van Loon, TITLE OF INVENTION: NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE/DOCKET NUMBER: RAI
TELECOMMUNICATION INFORMATION:
TELEPHONE: (201) 235-5801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1000 CTGGTGAACGAGATCTTCAACGGGC 1024
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TOPOLOGY: linear MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                ATTORNEY/AGENT INFORMATION: NAME: Pokras, Bruce A.
                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FILING DATE: 09-JUN-1995
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121 ctggaagacgagatgaaagaggggc 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              940 TCCAAGCGCCCCGAGAACCTGGCCCACCACAGCGTCATCTTCGGCCCGCGCTACAAGGGG 999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                880 GCCGCGATCCTGAACCGGCAGCGCTGGTCGATGTCGCTGTTCGTGCTGCATTTCGGCCTG 939
                                                                                                                                                                                                                                                                                                                               STREET:
CITY: N
REFERENCE/DOCKET NUMBER:
            NAME: Pokras, Bruce A. REGISTRATION NUMBER: 32,748
                                                                  FILING DATE:
                                                                                                                                                                                                                                                                               COUNTRY: UZIP: 07110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                    APPLICATION NUMBER:
                                                                                                                                      FILING DATE:
                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME: Pokras, Bruce A. REGISTRATION NUMBER: 32,748
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     l Similarity
77; Conserv
                                                                                                                                                                                                                                                                                                                              Nutley
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         , Application US/09298718 6124113
                                                                                                                                                                                                                                                                                                             Ŋ
                                                                                                                                                                                                                                                                                                                                                340 Kingsland
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1482 base pairs
                                                                                                                                                                                                                                                                                               USA
                                                                                                                                                                                                                                                                                                                                                                                                                                  van Loon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Tessier, Michel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pasamontes,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Hohmann,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                Hoffmann-La Roche Inc. 
0 Kingsland Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                  ), Adolphus
FERMENTATIVE CAROTENOID PRODUCTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hans-Peter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EP 95108888.9
                                                                                  08/660,645
                                                                                                                                                      US/09/298,718
RAN 6002/170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RAN 6002/170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 36.2; DB
Pred. No. 0.46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 1482;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
```

```
멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; TOPOLOGY: 11; MOLECULE TYPE: US-09-298-718-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-260-202A-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Patent No. 5573910
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 10, Application US/08260202A Patent No. 5573910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 8.4%;
Best Local Similarity 53.1%;
Matches 77; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX: (201) 235-2363 INFORMATION FOR SEQ ID NO:
                    TELEFAX: (512) 474-75 INFORMATION FOR SEQ ID NO:
                                                                                                                                                      PRIOR APPLICATION UMBER: US OF APPLICATION NUMBER: US OF APPLICATION NUMBER: US OF APPLICATION NUMBER: 12-FEB-1993
                                                                                                                                                                                                                  PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/260,202
FILING DATE: 15-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
SEQUENCE CHARACTERISTICS:
                                                      REFERENCE/DOCKET NUMBER: UT TELECOMMUNICATION INFORMATION: TELEPHONE: (512) 418-3000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1000 CTGGTGAACGAGATCTTCAACGGGC 1024
                                                                                                                                                                                                                                                                                                                                 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELECOMMUNICATION INFORMATION:
                                                                                                                                            ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121 ctggaagacgagatgaaagaggggc 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  880 GCCGCGATCCTGAACCGGCAGCGCTGGTCGATGTCGCTGTTCGTGCTGCATTTCGGCCTG 939
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            940 TCCAAGCGCCCCGAGAACCTGGCCCACCACCACCATCTTCGGCCCGCGCTACAAGGGG
                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0,
                                                                                                             NAME: Hodgins, Daniel REGISTRATION NUMBER: :
                                                                                                                                                                                                                                                                            CLASSIFICATION:
                                                                                                                                                                                                                                                                                               FILING DATE
                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY: USA
ZIP: 77210-4433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61 ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggtttgatgcgg 120
                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nucleic acre
nucleic acre
double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Houston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ΤX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1482 base pairs ucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Deretic, Vojo
Martin, Daniel W.
                                     (512) 474-7577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Arnold, White & Durkee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 201) 235-5801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PSEUDOMONAS AERUGINOSA INFECTING CYSTIC FIBROSIS PATIENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DETECTION OF CONVERSION TO MUCOIDY IN
                                                                                                                                                                                    US 08/017,114
                                                                                                                                                                                                                                                                                                              US/08/260,202A
                                                                                                             31,026
                                                                                            UTSK: 221\HOD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 36.2; DB Pred. No. 0.46;
                                                                                                                                                                                                                                                                                                                                                    Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1482;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sde
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
```

```
망
                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                     ; TOPOLOGY: 1; MOLECULE TYPE: US-08-017-114-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 9
US-08-017-114-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-08-260-202A-10
                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 10
Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                        TELEPHONE: 512/320-7200
TELEFAX: 512/474-7577
TELEX: N/A
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                          ATTORNEY/AGENT INFORMATION:
NAME: Hodgins, Daniel S.
REGISTRATION NUMBER: 31,0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQUENCES:
CORRESPONDENCE ADDRESS
1132 GCTGCTGCAACGAGAAGGGGCAGTTGCTCGAGCGCTTCCAGTTCACCCAGTTGAATAC 1191
                                                                                                                                                                                                                                      SEQUENCE CHARACTERISTICS:
LENGTH: 1800 base pairs
                                                                                                                                                                                                                                                                                                                                           TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Martin, Daniel W.
TITLE OF INVENTION: DETECTION OF CONVERSION TO MUCOIDY IN
TITLE OF INVENTION: PSEUDOMONAS AERUGINOSA INFECTING CYST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1252 GGCCAAGGCCGACGGGGAGAAGACCGTGGCCTCGGCGCTCGGAAT 1295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1192 CGGCGCGCACCTGCCGAAGACCACTTGCAGGCGGGGGGGCGCCGAATGCCAGGTCGTCGGCCC 1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1132 GCTGCTGCTGAACGAGAAGGGGCCAGTTGCTCGAGCGCTTCCAGTTCACCCCAGTTGAATAC 1191
                      111 gttgatgcggctggaagacgaagatgaaagaggggcgctacgaggtacgcgggagcttcc 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            231 ggccgagcgcaccgagcagaaggacttagacggtcgctcggaat 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        171 cggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaa 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             111 gttgatgcggctggaagacgagatgaaagagggcgctacgaggtacgcgcgggggcttcc 170
                                                                                                                                                                                                                                                                                                                                                                                                                            CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: US
FILING DATE: 19930212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                      STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRANDEDNESS: si
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                              REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10, Application US/08017114
o. 5591838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   77210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Houston
                                                                                                                                                                                                                      NUCLEIC ACID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Texas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      P. O. Box 4433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Deretic,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Arnold, White & Durkee
                                                                                                                                                                                        linear
                                                                                                                                                                     DNA (genomic)
                                                                                                                                                                                                   single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8.3%;
51.2%;
                                                                                8.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PSEUDOMONAS AERUGINOSA INFECTING CYSTIC FIBROSIS PATIENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/08/017,114
                                                                                                                                                                                                                                                                                                                                                                        31,026
                                                                                                                                                                                                                                                                           10:
                                                                                                                                                                                                                                                                                                                                                            UTSK:205/HOD
                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                  Score 36; DB 1, Pred. No. 0.54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 36; DB 1
Pred. No. 0.54;
                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Version
                                                                                                  DB 1; Length 1800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 1; Length 1800;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8O;
                                                                 ,08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                 Indels
                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0,
                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                 0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
```

```
δÃ
                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
  밁
                                   Qy
                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                          US-08-505-307-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-08-505-307-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 10, Application US/08505307 Patent No. 6083691
                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEFAX: (713) 789-26 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Deretic, vojo
APPLICANT: Deretic, vojo
APPLICANT: Martin, Daniel W.
TITLE OF INVENTION: DETECTION OF CONVERSION TO MUCOIDY IN
TITLE OF INVENTION: PSEUDOMONAS AERUGINOSA INFECTING CYSTIC FIBROSIS
1252
                                                                            1192
                                                                                                                                                          1132 GCTGCTGCTGAACGAGAAGGGGCAGTTGCTCGAGCGCTTCCAGTTCACCCAGTTGAATAC 119:
                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE CHARACTERISTICS:
LENGTH: 1800 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELECOMMUNICATION INFORMATION:
TELEPHONE: (512) 418-3000
TELEFAX: (713) 789-2679
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/017,114
FILING DATE: 12-FEB-1993
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOFTWARE: PatentIn Release #1.0, Version #1.30 CURRENT APPLICATION DATA: APPLICATION UMBER: US/08/505,307 FILING DATE: 24-NOV-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1252 GGCCAAGGCCGACGGGGAGAAGACCGTGGCCTGGCGCTCGGAAT 1295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1192 CGGCGCGCACCTGCCGAAGACCAGTTGCAGGCGGGCGCCGAATGCCAGGTCGTCGGCCC 1251
                                                                                                                   171
                                                                                                                                                                               111 gttgatgcggctggaagacgagatgaaagagggcgctacgaggtacgcggcggagcttcc 170
                    231 ggccgagcgcaccgagcagaaggacttagacggtcgctcggaat 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COUNTRY: USA 771P: 77210-4433
                                                                                                                                                                                                                                                       Match 8.3%;
Local Similarity 51.2%;
                                                                                                                                                                                                                                                                                                                                                          STRANDEDNESS: sir
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: Houston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                  LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                            CGGCGCGCACCTGCCGAAGACCAGTTGCAGGCGGGCGCCGAATGCCAGGTCGTCGGCCC 125
                                                                                                             cggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaa 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggccgagcgcaccgagcagaaggacttagacggtcgctcggaat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cggggtcgaccccgacaaggacgtccacattatggtccgcgatggtccagctgaccatcaa
GGCCAAGGCCGACGGGGAGAAGACCGTGGCCTTGGCGCTCGGAAT
                                                                                                                                                                                                                                         84;
                                                                                                                                                                                                                                                                                                                                                                                                nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hodgins, Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ΤX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              P.O. Box 4433
                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Arnold, White & Durkee
                                                                                                                                                                                                                                                                                                                                                                             single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31,026
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ß
                                                                                                                                                                                                                                     Score 36; DB 3; Pred. No. 0.54; 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            UTSK:231
                                                                                                                                                                                                                                                                            DB 3; Length 1800;
                                                                                                                                                                                                                                       80; Indels
                                                                                                                                                                                                                                       0,
                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PATIENTS
                                                                                                                                                                                                                                       0;
```

RESULT

```
US-08-196-218-31
; Sequence 31, Application US/08196218
; Patent No. 5614619
; GENERAL INFORMATION:
                                                                                                                                                                                                              망
                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                   В
                                                                                                                                          В
                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PCT-US94-02034-10 ; Sequence 10, Application PC/TUS9402034 ; GENERAL INFORMATION:
                                                                                       RESULT 12
                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 84; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 1800 base pair
                                                                                                                                                                                                                                                                                                                                                                                                                                              US94-02034-10
                                                                                                                                                                                                                1192
                                                                                                                                                                                                                                                                                   1132
APPLICANT: Piepersberg, Wolfgang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/017,114
FILING DATE: 12 February 1993 (12.02.93)
ATTORNEY/AGENT INFORMATION:
NAME: HODGINS, DANIEL S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: APPLICANT:
                                                                                                                                            1252
                                                                                                                                                                                                                                                                                                                                                                                                                                                           TOPOLOGY: 1: MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REGISTRATION NUMBER: 31,026
REFERENCE/DOCKET NUMBER: UTI
TELECOMMUNICATION INFORMATION:
TELEPHONE: 512/320-7200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: TELEPHONE APPLICANT: TELEFAX: TITLE OF INVENTION: TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: FLOPPY DISK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
                                                                                                                                                                           231
                                                                                                                                                                                                                                                                                                             111 gttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcc 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                             171 cggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaa 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: /1...
TELEFAX: 79-0924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY: US
ZIP: 77210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CITY:
STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEPHONE: 514/0-
TELEPHONE: 514/0-
TELEPHONE: 514/0-
TELEPHONE: 514/0-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: FILING DATE: UNKNOWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                             ggccgagcgcaccgagcaggaaggacttagacggtcgctcggaaat 274
                                                                                                                                                                                                                                                                                 GCTGCTGCTGAACGAGAAGGGGCAGTTGCTCGAGCGCTTCCAGTTCACCCAGTTGAATAC 1191
                                                                                                                                            GGCCAAGGCCGACGGGGAGAAGACCGTGGCCTGGCGCTCGGAAT 1295
                                                                                                                                                                                                                CGGCGCGCACCTGCCGAAGACCAGTTGCAGGCGGGCGCCGAATGCCAGGTCGTCGGCCC 1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Houston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Texas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1800 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         E: Arnold, White & Durkee P. O. Box 4433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CITY:
STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNTRY: United States or POSTAL CODE: 78701
TELEPHONE NO: (512)499-4462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STREET:
                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : (512)499-4523

DETECTION OF CONVERSION TO MUCOIDY IN PSEUDOMONAS AERUGINOSA INFECTING CYSTIC FIBROSIS PATIENTS
                                                                                                                                                                                                                                                                                                                                                                     8.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PC-DOS/MS-DOS/ASCII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                United States of America
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Texas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     201 West 7th Street Austin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PCT/US94/02034
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10:
                                                                                                                                                                                                                                                                                                                                                     Score 36; DB 4; Length 1800; Pred. No. 0.54; 0; Mismatches 80; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         UTFK231P--
                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                         0;
```

```
밁
                                                                                          QΥ
                                                                                                                         В
                                                                                                                                                     Qy
                                                                                                                                                                                         В
                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                       Query Match
Best Local Similarity
"hes 94; Conserva
                                                                                                                                                                                                                                                                                                                                  ; LOCATION: US-08-196-218-31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATTORNEY/AGENT INFORMATION:
NAME: Ogden, Stasia L.
REGISTRATION NUMBER: 36,228
REFERENCE/DOCKET NUMBER: 0248
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202,408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE: 202-408-400
TELEFAX: 202-408-4400
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                              1142
                                                                                                                                                                                         1022
 1202
                                                                                                                                                                                                                                                                                                                                                                                 FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                             FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Brau, Barbara TITLE OF INVENTION: Secondary-Metabolite Biosynthesis Genes TITLE OF INVENTION: From Actinomycetes, Method of Isolating TITLE OF INVENTION: Use.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                               262
                                                                                                                                                          142
                                                                                                                                                                                                          82 gccggactccggcccaccttcgacacccggttgatgcggctggaagacgagatgaaagag 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: US/0 FILING DATE: 25-AUG-1994 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STREET: 1300 I St
CITY: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE: Finneg
                                                                                                                                                                                                                                                                                                                                                                   NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                              LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENGTH: 2634 base pairs
                   ggtcgctcggaa 273
                                                                              atggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcagaaggacttagac 261
                                                                                                                                             gggcgctacgaggtacgcggagcttcccgggggtcgaccccgacaaggacgtccacatt 201
                                                                                                                                                                                         GGCGAGCGCCGCCGTCCTGGTGACGTCCGGGAGCCGGGTCGCCAAGGAGAGCTACGAC 108:
GCCGGCTGGGCA 1213
                                                            ATCGTCGCCGCGCAAGCGGTCGCCGACGCCCTGCACGACGAACTGCCGGGCATCCGG 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RY: United States 20005-3315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1300 I Street, N.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Distler, Jurgen
Grabley, Susanne
Sichel, Petra
                                                                                                                                                                                                                                                    8.1%;
ilarity 49.0%;
Conservative (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Stockmann, Michael
Taleghani, Kampiz Mansouri
                                                                                                                                                                                                                                                                                                                                                                                             CDS
416..1531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             linea
                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                             3..401
                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                  1561..2625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Finnegan, Henderson, Farabow, Garrett &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US/08/196,218
                                                                                                                                                                                                                                                        0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       02481.1372-00000
                                                                                                                                                                                                                                                    Score 35.2; DB Pred. No. 0.95; 0; Mismatches
                                                                                                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                                                                        98;
                                                                                                                                                                                                                                                                                    Length 2634;
                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Them, and Their
                                                                                                                                                                                                                                                        Gaps
                                                                                                                              1141
                                                                                                                                                                                                                                                         0
```

US-08-681-953-31

Sequence

RESULT

ţ

```
ş
                                            밁
                                                                     Š
                                                                                                                                                                       US-08-681-953-31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Patent No.
                                                                                                  Matches
                                                                                                               Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                  TELEFAX: 202-408-4400 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                            1022
                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE/DOCKET NUMBER: 02
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202-408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOFTWARE: PatentIn Rel CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
NAME: Ogden, Stasia .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
142 gggcgctacgaggtacgcgcggagcttcccggggtcgaccccgacaaggacgtccacatt 201
                                                                                                                                                                                 NAME/KEY:
                                                                      82
                                                                                                                                                                                                                                                                                                                                         STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME: Ogden, Stasia L. REGISTRATION NUMBER: 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE: 30 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                           NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: US 08/196,218 FILING DATE: 25-AUG-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US/08/681,953
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                              LOCATION:
                                                                                                                                                                                                                                                                       LOCATION:
                                                                                                                                                                                                                                                                                    NAME/KEY:
                                                                                                                                                                                                                                                                                                                               TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ADDRESSEE
                                                                                                                                                                                                                                                                                                                                                                      ENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31,
5710032
                                            GGCGAGCGCCGCCGTCCTGGTGACGTCCGGGAGCCGGGTCGCCAAGGAGAGCTACGAC 1081
                                                            gccggactccggcccaccttcgacacccggttgatgcggctggaagacgagatgaaagag 141
                                                                                                 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20005-3315
                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Washington D.C.
                                                                                                                                                                                                                                                                                                                                                        nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Application US/08681953
                                                                                                                                                                                                                                                                                                                                                                      2634 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1300 I Street, N.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    United States
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Grabley, Susanne
Sichel, Petra
                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Brau, Barbara
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Distler, Jurgen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sichel,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Taleghani, Kampiz Mansouri
                                                                                                                                                                                                                            CDS
416..1531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Stockmann,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Piepersberg, Wolfgang
                                                                                                                                                                                                                                                                    3..401
                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                               linear
                                                                                                                                                                                   CDS
1561..2625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Dunner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Finnegan, Henderson, Farabow,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30-JUL-1996
                                                                                                                                                                                                                                                                                                              DNA (genomic)
                                                                                                                                                                                                                                                                                                                                         single
                                                                                                              8.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Use.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               From Actinomycetes, Method of Isolating Them, and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Secondary-Metabolite Biosynthesis Genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Michael
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      36,228
                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            02481.1372-00000
                                                                                               Score 35.2; DB Pred. No. 0.95; O; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Version
                                                                                                                           DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Garrett
                                                                                                 98;
                                                                                                                           Length 2634;
                                                                                                 Indels
                                                                                                 0;
                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Their
                                                                                                 0;
```

```
Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                 20
                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-08-910-856-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
                                                                                                                                                                                   US-08-910-856-1
                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 1,
                                                                                                       Matches 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: DOI, YOSHIHARU
TITLE OF INVENTION: POLYES
TITLE OF INVENTION: FOR PI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1202 GCCGGCTGGGCA 1213
                                                                                                                                                                                                                                                                                                                                                                  TELECOMMUNICATION INFORMATION: TELEPHONE: 619-678-5070
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRIOR APPLICATION DATA:
APPLICATION NUMBER: JP 1
FILING DATE: 25-JUL-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1082 AAGAACTTCGAATTCCTGCGCGGCCTCGCCAAGGACGTCGCCGCCTGGGGACGTCGAGCTG 1141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                               FEATURE:
                                                                                                                                                                                                                                             MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTORNEY/AGENT INFORMATION:
                                               388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             202
199 attatggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcagaaggactta 258
                                                                                                                                                                                                NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: JP 214509/1996 FILING DATE: 14-AUG-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: US/08/910,856 FILING DATE: 13-AUG-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET:
                                                                                                                                                                                                                                                             TOPOLOGY:
                                                                                                                                                                                                                                                                        STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                     TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                               REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                               NAME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOFTWARE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE:
                                                                                                                                                                                                                                                                                                      LENGTH:
                                                                gaggggcgctacgaggtacgcgcgggagcttcccggggtcgaccccgacaaggacgtccac 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggtcgctcggaa 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     atggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcagaaggacttagac 261
                                               GAGGGCGTCCCCCAGAAGAGCCGGGAGCGGCTGCGTTTCTTCACCCGCCAGTACGTCAAC 447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATCGTCGCCGCGCGGAAGCGGTCGCCGACGCCCTGCACGACGAACTGCCGGGCATCCGG 1201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         92037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LA
                                                                                                                                                                                                                                                                                        : 1785 base pairs nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                               HAILE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Application US/08910856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EE: FISH & RICHARDSON P.C.
4225 EXECUTIVE SQUARE, SUITE 1400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                     619-678-5099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOLLA
                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PatentIn Release #1.0, Version #1.30 (EPO)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FUKUI,
                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                          linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E: Floppy disk
IBM PC compati
                                                                                                                                                                                                                                                                                                                                                                                                                              LISA A.
                                                                                                                                                                                                                                             DNA
                                                                                                                                                                                                                                                                          double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TOSHIAKI
                                                                                                                      8.0%;
47.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PC-DOS/MS-DOS
                                                                                                                                                                                                                                            (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               POLYESTER SYNTHASE GENE FOR PRODUCING POLYESTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JP 199979/1997
                                                                                                                                                                                                                                                                                                                                                                                                              38,347
                                                                                                                                                                                                                                                                                                                                     1:
                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                 07898/016001
                                                                                                                      Score 34.4;
Pred. No. 1.
                                                                                                       ed. No. 1.4;
Mismatches 111;
                                                                                                                                    DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AND
                                                                                                                                     Length 1785;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PROCESS
                                                                                                       Indels
                                                                                                       0;
                                                                                                       Gaps
                                                                                                         0,
```

```
밁
                                                                                                                                                                                 ;
US-08-910-856-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 15
US-08-910-856-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                              Query Match 8.0
Best Local Similarity 47.6
Matches 101; Conservative
                                                                                                                                                                                                                                                                                                                                             TELECOMMUNICATION INFORMATION:
TELEPHONE: 619-678-5070
TELEFAX: 619-678-5099
INFORMATION FOR SEQ ID NO: 9:
SEQUENCE CHARACTERISTICS:
LENGTH: 3187 base pairs
TYPE: nucleic acid
STRANDEDNESS: double
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 9, Application US/08910856 Patent No. 5981257 GENERAL INFORMATION:
1217 GAGGGCGTCCCCCAGAAGAGCCGGGAGCGGCTGCGTTTCTTCACCCGCCAGTACGTCAAC 1276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: PC-DOS/MS-DOS
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30 (EPO)
CURRENT APPLICATION NUMBER: US/08/910,856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: FUKUI, TOSHIAKI
APPLICANT: DOI, YOSHIHARU
TITLE OF INVENTION: POLYESTER SYNTHASE GENE AND PROCESS
TITLE OF INVENTION: FOR PRODUCING POLYESTER
NUMBER OF SEQUENCES: 16
                                                                                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION DATA:
APPLICATION NUMBER: JP 199979/1997
FILING DATE: 25-JUL-1997
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR APPLICATION DATA:
APPLICATION NUMBER: JP 214509/1996
FILING DATE: 14-AUG-1996
                                                                                                                                                                                                                                                                                                           FEATURE:
                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
                     139 gaggggcgctacgaggtacgcgggagcttcccggggtcgaccccgacaaggacgtccac 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               568 GCCGATCAGCTCAACATCCGCCTGACCGACGA 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          319 gctgacgaggacgacattaaggccacctacga 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        259 gacggtcgctcggaattcgcgtacggttccttcgttcgcacggtgtcgctgccggtaggt 318
                                                                                                                                                                                                                                                                   NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               508 TCCGACGGCCAGAACCTGGTGCGCGGACTGGCCCTCTTGGCCGAGGATCTGGAGCGCAGC 567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             448 GCCATGGCCCCCAGCAACTTCCTGGCCACCAACCCCGAGCTGCTCAAGCTGACCCTGGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME: HAILE, LISA A.
REGISTRATION NUMBER: 38,347
REFERENCE/DOCKET NUMBER: 07898/016001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COUNTRY: USA
ZIP: 92037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET: 4225 E:
CITY: LA JOLLA
STATE: CA
                                                                                                                                                                                                                         NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 E: FISH & RICHARDSON P.C.
4225 EXECUTIVE SQUARE, SUITE 1400
                                                                                                                                                                                                      CDS
830..2611
                                                                                                                                                                                                                                                                   CDS
384..734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13-AUG-1997
                                                                                                 8.0%;
47.6%;
                                                                           Score 34.4; DB 2;
Pred. No. 1.6;
0; Mismatches 111;
                                                                                                                    Length 3187;
                                                                                Indels
                                                                              0;
                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             507
                                                                              0
```

Search completed: January 12, 2001, 20:14:22 Job time: 26530 sec

000

```
굕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Minimum DB seq
Maximum DB seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tal number of hits satisfying chosen parameters:
                                                                                              Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N_Geneseq_36:*
1: /SIDS6/gcgdai
2: /SIDS6/gcgdai
3: /SIDS6/gcgdai
4: /SIDS6/gcgdai
5: /SIDS6/gcgdai
5: /SIDS6/gcgdai
6: /SIDS6/gcgdai
7: /SIDS6/gcgdai
8: /SIDS6/gcgdai
                                                                                                                                                                                                           10:
11:
12:
13:
14:
15:
16:
16:
19:
20:
                                                                                                                                                                                                                            /SIDS6/gcgdata/geneseq/yeneseqn/NA1985.DAT:*
/SIDS6/gcgdata/geneseq/yeneseqn/NA1986.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1986.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1987.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1988.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1991.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1991.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1992.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1997.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1998.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1998.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1998.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1998.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1998.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1998.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480022 segs, 187831343 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-461-774-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            January 12,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccaccacccttcccgttca....agatccggtccaccaactga 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /SIDS6/gcgdata/geneseq/geneseqn/NA1980.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1981.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1982.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1984.DAT:*
                                                                                                                                                                                                        /SIDS6/gcgdata/geneseq/geneseqn/NA2000.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2001, 20:07:53; Search time 244.98 Seconds
                                                  SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (without alignments)
662.447 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             960044
```

Result	Score	Query Match	Query Match Length	DB	ID	Description
<u></u>	428.8	99.3	474	20	X17761	Acr gene encoding
2	425.8	98.6	1081	20	Z20195	Mycobacterium tube
ω	425.8	98.6	1104	20	Z20204	
4	425.8	98.6	1299	20	220200	
5	425.8	98.6	2577	20	Z20199	
6	40.6	9.4	2742	19	V49291	Aujeszky's disease
7	39.8	9.2	1108	14	Q49396	Class II AP endonu
80	39.4	9.1	972	16	T00591	ceff (ORF9) encodi
9	39.4	9.1	2672	16	T08693	Cephamycin biosynt
10	39	9.0	4897	11	Q03259	Pseudorabies virus
11	37	8.6	707	20	216654	Human gene express
12	37	8.6	1894	18	T66542	50K-cellulase gene

45	44	43	42	41	40	39	38	37	36	35 5	34	ယ	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
ω ·		ω.	ω.	34	4.	4.	4.	34.4			4.	4.	4.	4.	35	5	5	5		5	5	5	5	5	36	36	36	٥.	ς,	6.	36.2	6.
																															8.4	
620	620	371	352	2888	4104	34094	3187	3187	3187	3187	1785	1785	1785	3060	7926	3027	3027	3027	3027	2860	2634	1538	1109	1109	1800	1800	351	17091	11233	8625	8625	2760
17	17	21	21	17	21	20	20	20	19	19	20	20	19	21	21	20	20	19	19	18	14	18	18	18	15	15	21	20	19	19	18	16
2912	T29126	3198	A31634	T59268	265053	Z30163	225628	Z31773	V15498	V15499	225625	231771	V15493	D00333	Z89190	Z19095	219307	V44397	V64506	T63303	Q39093	T63302	T91457	T91523	Q70238	Q70237	A31539	x60096	V40151	V40146	T45143	Q79921
gene	gene fragmen	Plant microsatelli	Plant microsatelli		-bound p	ਰ	A. caviae polyeste	Full length polyes	Aeromonas caviae p				Aeromonas caviae p	Rice raffinose syn	Plasmid TTO1A 103L	M. tuberculosis re	M. tuberculosis an	Mycobacterium tube	M. tuberculosis im	_	Streptomyces nodos				P. aeruginosa mucA	P. aeruginosa mucA	Plant microsatelli	Acetobacter xylinu		Flavobacterium sp.	lavobacterium	P. aeruginosa accB

ALIGNMENTS

RESULT RESULT ID 751 ID X17761 standard; DNA; 474 BP.

11-MAY-1999 (first entry)

X17761;

Acr gene encoding alpha-crystallin heat shock protein.

Tuberculosis; Mycobacterium; alpha-crystallin heat shock protein; acr gene; attenuated; vaccine; antimycobacterial; pathogenic; ss.

Mycobacterium sp.

Key CDS Location/Qualifiers 16..450 /*tag= a

09-JUL-1998; 98WO-US14227

21-JAN-1999 W09902670-A1

10-JUL-1997; 97US-0052199.

Barry CE, Crane D,

(USSH) US DEPT HEALTH & HUMAN SERVICES

WPI; 1999-120871/10

P-PSDB; W94900

Novel attenuated strains of Mycobacterium tuberculosis and M. bovis

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The invention relates to a vaccine for protection against tuberculosis i which Mycobacterium sp. are attenuated by having the expression of the alpha-crystallin heat shock protein gene (acr gene) reduced by at least 75 percent. The attenuated strains can be used as models for screening for novel antimycobacterial agents. Also, the mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. bovis and M. tuberculosis, used for commercial adjuvants, used as diagnostics including use as reagents for the development of monoclonal antibodies to recognize wild type mycobacteria in patient samples. The vaccine is based on M. tuberculosis and is obtained without the multitude of passages so that the immune response generated is more relevant to the wild type, pathogenic bacteria. The present sequence represents the acr gene encoding the alpha-crystalline heat shock protein.

    useful
achieved

                    diagnosis;
                                   Tuberculosis; antigen; fusion protein; Mtb39A;
                                                                                                   17-JAN-2000
                                                                                                                                                                    Z20195
                                                                   Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 474 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      alpha-crystallin
                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                  319
                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                   259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         / Match
Local Similarity
                                                                                                                                                                                                                                                                   tccaccaactga 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg
                                                                                                                                                                                                                                                                                                               cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                                                               gtgtcgctgccggtaggtgctgacgacgacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                               cccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tlcgcggccttcccgtcattcgccggactccggccaccttcgacaccccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg
                                                                                                                                                                                                                                                  tccaccaactga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cccgacaaggacgtcgacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccgggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            430;
                                                                                                                                                                  standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    in the production of a vaccine against tuberculosis, by reducing or eliminating expression of the
                therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                  tuberculosis antigen fusion protein Mtb39A DNA.
                                                                                                                                                                  DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     heat shock protein
                                                                                                                                                                                                                                                  450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    33pp; English
                    vaccine;
                                                                                                  entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99.3%;
                                                                                                                                                                  ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ç;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 428.8;
Pred. No. 7.5e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ر.
د
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        90 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3; DB 20;
7.5e-105;
                                   ERD14; DPV; MTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                               420
                                                                                                                                                                                                                                                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                                                                                                                                               318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                            Q
                                                                  밁
                                                                                              Ωy
                                                                                                                                  밁
                                                                                                                                                               Q
                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                          Q
 밁
                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DNA is useful for the recombinant production of the fusion protein. Coding sequences for the antigens were modified by pCR in order to facilitate their fusion and subsequent expression of the fusion protein. 3 Coding sequences for ERD14, DPV and MTI were ligated to encode Mtb39A. The invention provides fusion proteins (see Y32059-71) containing at least 2 M. tuberculosis antigens. The new fusion proteins and polynucleotides encoding them are useful as vaccines for preventing tuberculosis (claimed), for diagnosis (via in vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of disease progression, and treatment of tuberculosis. They are more effective immunogens than mixtures of the individual protein components.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This DNA sequence includes a coding region for a recombinant Mycobacterium tuberculosis tri-antigen fusion protein (see Y termed Mtb39A, composed of the antigens ERD14, DPV and MTI.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       New fusion proteins useful for tuberculosis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        07-APR-1998;
30-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 1081 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Example; Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1999-601610/51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         07-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (CORI-) CORIXA CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14-OCT-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9951748-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mycobacterium tuberculosis.
 334
                                301
                                                                  274
                                                                                                  241
                                                                                                                                                                                               154
                                                                                                                                                               181
                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity nes 427; Conserv
                                                                                                                                                                                                                                                                 94
                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                34
                                                                                                                                                                                                                                                                                                                            ctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccggggtcgac
gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
               gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                            cccgacaaggacgtcgacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                               cccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                            ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg
                                                                                                                                                                                                                                                                              ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg 120
                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Alderson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98US-0056556
98US-0223040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       99WO-US07717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       83pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Location/Qualifiers 10..1002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               209 A;
                                                                                                                                                                                                                                                                                                                                                                                                             98.6%;
99.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              341 C; 325 G; 206 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Campos-Neto
                                                                                                                                                                                                                                                                                                                                                                                            Score 425.8;
Pred. No. 5.6e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      diagnosis,
                                                                                                                                                                                                                                                                                                                                                                                                ).6e-104;
tes 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      prevention
                                                                                                                                                                                                                                                                                                                                                                                                                                DB
                                                                                                                                                                                                                                                                                                                                                                                                                                20;
```

and

treatment

0

Y32060),

Indels Length

0

Gaps

0;

93 60

180

333 300 273 240 213 1081;

밁 οy 밁 Q ₽ Ş ₽ Qy 멍 Ωy

В Qy В Qy

```
CCXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT
Z20204
  B
                          δÃ
                                                                                                                   DXAXAXI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                 Query
Best L
                                                   Matches
                                                                                                                                                                                        This DNA sequence includes a coding region for a recombinant Mycobacterium tuberculosis tri-antigen fusion protein (see Y32069), termed MtD36f, composed of the antigens ERD14, DPV and MTI. The DNA is useful for the recombinant production of the fusion protein. Coding sequences for the antigens were modified by PCR in order to facilitate their fusion and subsequent expression of the fusion protein, and were then ligated to obtain the present polynucleotide. The invention provides fusion proteins (see Y32059-71) containing at least 2 M. tuberculosis antigens. The new fusion proteins and polynucleotides encoding them are useful as vaccines for preventing tuberculosis (claimed), for diagnosis (via in vitro assays or introduced).
                                                                                                                                                      tuberculosis (claimed), for diagnosis (via in vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of disease progression, and treatment tuberculosis. They are more effective immunogens than mixture
                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 1999-601610/51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      07-APR-1998;
30-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Tuberculosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17-JAN-2000 (first entry)
                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                           tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                      New fusion proteins useful for diagnosis,
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Skeiky YAW, Alderson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (CORI-) CORIXA CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            07-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Z20204;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Z20204 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
  28
                                                                 Local
                                                                              Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω
                                                                                                                                          individual protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tccaccaac 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cttactgtgtcggttgccggtttcggaagggaagccaaccgaaaagcacattcagatccgg
               gccaccaccettcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg 60
gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg 87
                                                     al Similarity 99. 427; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tccaccaac 462
                                                                                                                                                                                                                                                                                                                                                                                                                 Y32069
                                                                                                                   1104
                                                                                                                                                                                                                                                                                                                                                Fig 11A-B; 83pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            antigen; fusion protein; Mtb36f;
                                                                                                                   BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tuberculosis antigen fusion protein Mtb36f DNA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98US-0056556.
98US-0223040.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            99WO-US07717.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA;
                                                                                                                   216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              vaccine;
                                                               98.
                                                                                                                   A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1104 BP
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ĭ
                                                                                                                                            components.
                                                               .5%;
                                                                                                                   347
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Campos-Neto
                                                     0;
                                                   Score 425.8;
Pred. No. 5.6e
0; Mismatches
                                                                                                                  c;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                immunogen; ss.
                                                                                                                   333
                                                                                                                  G;
                                                                                                                   208
                                                   .6e-104;
.es 2;
                                                                                                                                                                                                                                                                                                                                                                                      prevention and
                                                                              DB
                                                                                                                   Η,
                                                                                                                   0
                                                                             20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ERD14; DPV; MTI;
                                                                                                                   other;
                                                     Indels
                                                                          Length 1104;
                                                                                                                                                       mixtures
                                                                                                                                                                                                                                                                                                                                                                                     treatment
                                                     0;
                                                                                                                                                                    of.
                                                  Gaps
                                                                                                                                                       of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                453
                                                                                                                                                                                                                                                                                                                                                                                      of
                                                     0;
```

```
RESULT
220200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
This DNA sequence represents a coding region for a recombinant Mycobacterium tuberculosis tetra-antigen fusion protein (see Y32065), termed Mtb46f, composed of the antigens ERD14, DPV, MTI and MSL. The DNA is useful for the recombinant production of Mtb46f. The coding sequences for the antigens were modified by PCR in order to facilitate their fusion and subsequent expression of the fusion protein. The coding sequences for the 4 antigens were ligated to encode Mtb46f. The invention provides fusion proteins (see
                                                                                                                                                                              WPI; 1999-601610/51.
P-PSDB; Y32065.
                                                                                                                                                                                                                   Skeiky YAW,
                                                                                                                                                                                                                                                                   07-APR-1998;
30-DEC-1998;
                                                                                                                                                                                                                                                                                                      07-APR-1999;
                                                                                                                                                                                                                                                                                                                                                      W09951748-A2
                                                                                                                                                                                                                                                                                                                                                                                                     Tuberculosis; antigen; fusion protein; Mtb46f; ERD14; DPV; MTI: MSL; diagnosis; therapy; vaccine; immunogen; ds.
                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis antigen fusion protein Mtb46f DNA.
                                                                                                                Example; Fig 7A-B; 83pp; English.
                                                                                                                                        New fusion proteins useful for diagnosis, tuberculosis -
                                                                                                                                                                                                                                                                                                                               14-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    17-JAN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Z20200 standard;
                                                                                                                                                                                                                                          (CORI-) CORIXA CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ttcgcggccttcccgtcattcgccggactccggccaccttcgacacccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tccaccaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cccgacaaggacgtcgacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ctggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccgggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ctggaagacgagatgaaagaggggcgctacgaggtacgcgcggggggcttcccgggggtcgac 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tccaccaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                =
=
=
=
                                                                                                                                                                                                                   Alderson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                                                                                                                                                                                                                                                                                                               tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            429
                                                                                                                                                                                                                                                                   98US-0056556
98US-0223040
                                                                                                                                                                                                                                                                                                      99WO-US07717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA;
                                                                                                                                                                                                                   ź
                                                                                                                                                                                                                   Campos-Neto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ΒP
                                                                                                                                                    prevention and treatment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       207
                                                                                                                                                     of
```

```
В
                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            35353535383
3535353883
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               vaccines for preventing tuberculosis (claimed), for diagnosis (via in vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of disease progression, and treatment of tuberculosis. They are more effective immunogens than mixtures of the individual protein components.
              07-APR-1999;
                                                                                                                                       Mycobacterium
                                                                                                                                                              Tuberculosis; antigen;
MSL; MTCC2; diagnosis;
                                                                                                                                                                                                    Mycobacterium
                                                                                                                                                                                                                             17-JAN-2000
                                                              W09951748-A2
                                                                                                                                                                                                                                                                              Z20199
                                       14-OCT-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 1299 BP; 234 A; 407 C; 408 G; 250 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                fusion
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Y32059-71) containing
                                                                                                                                                                                                                                                                                                                                           448
                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                           388
                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                             328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                       G
                                                                                                                                                                                                                                                                                                                                                                                                      cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                      gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccggggttcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gccaccaccettcccgttccagcgccacccgcggtccctcttccccgagttttctgagctg
                                                                                                                                                                                                                                                                                                                                                                  tecaccaae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctggaagacgagatgaaagagggcgctacgaggtacgcgcgggagcttcccgggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttcgcggccttcccgtcattcgccggactccggccaccttcgacacccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg
                                                                                                                                                                                                                                                                                                                                           tccaccaac
                                                                                                                                                                                                                                                                                                                                                                                         cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                           gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cccgacaaggacgtcgacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                              standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                proteins and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                             (first entry)
                                                                                                                                       tuberculosis.
                                                                                                                                                                                                    tuberculosis antigen fusion
                                                                                                                                                                                                                                                                                                                                           456
                                                                                                                                                                                                                                                                                                                                                                  429
              99WO-US07717
                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                               DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ng at least 2 M. tuberculosis antigens. The polynucleotides encoding them are useful as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98.6%;
                                                                                                                                                                                                                                                                               2577
                                                                                                                                                              therapy;
                                                                                                                                                                           fusion protein; Mtb88f; ERD14; DPV; MTI;
                                                                                                                                                                                                                                                                              BP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 425.8;
Pred. No. 5.8
                                                                                                                                                                 vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                               immunogen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .8e-104;
                                                                                                                                                                                                   protein Mtb88f DNA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The new
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                             387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
```

```
В
                                                                                       Qy
                                                                                                                         Вр
                                                                                                                                                     ρy
                                                                                                                                                                                        Дb
                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                               γ
                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This DNA sequence represents a coding region for a recombinant (Mycobacterium tuberculosis penta-antigen fusion protein (see Y32064), termed Mtb88f, composed of the antigens RD14, DPV, MTI, MSL and MTCC2. The DNA is useful for the recombinant production of Mtb88f. Coding sequences for the antigens were modified by PCR in order to facilitate their fusion and subsequent expression of the fusion protein. The coding sequences for the 5 antigens were ligated to encode Mtb88f. The invention provides fusion proteins (see Y32059-71) containing at least 2 M. tuberculosis antigens. The new fusion proteins and polynucleotides encoding them are useful as vaccines for preventing tuberculosis (claimed), for diagnosis (via tin vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of disease progression, and treatment of tuberculosis. They are more effective immunogens than
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches 427;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mixtures of the individual protein components.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 2577 BP; 441 A; 840 C; 861 G; 435 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Example;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Skeiky YAW, Alderson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 1999-601610/51
448
                           421
                                                            388
                                                                                          361
                                                                                                                         328
                                                                                                                                                         301
                                                                                                                                                                                        268
                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                      208
                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                   148
                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                88
                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                               28
             tecaccaac
                                                                          cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg 420
                                                                                                                                     gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                     cccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                                                                                  ctggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccgggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                               ttcgcggccttcccgtcattcgccggactccggcccaccttcgacaccccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg
tccaccaac
                                                           cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                        gtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                             gccaccaccttcccgttcagcgccacccgggtccctcttccccgagttttctgagctg
                                                                                                                                                                                     cccgacaaggacgtcgacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                                                                  ctggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccgggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                ttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Fig 6A-B;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proteins useful for diagnosis, prevention and treatment of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                             429
456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98US-0056556
98US-0223040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              83pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98.6%;
99.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Campos-Neto A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 425.8; DB 20 Pred. No. 6.7e-104;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                           387
                                                                                                                                                                                                                      300
                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                147
                                                                                                                                                                                                                                                                                                                                                                                                                                                87
                                                                                                                                                                                        327
                                                                                                                                                                                                                                                      267
                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                   207
```

0;

RESULT V49291

= = = =

```
οy
                                                                                   밁
                                                                                                              γ
                                                                                                                                                                                                                                                                       SSSS
                                                                                                                                                                                                                                                                                                                                                              γQ
                             В
                                                                                                                                          DЬ
                                                                                                                                                                   ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 106
                                                                                                                                                                                                                                                                                                         against several pathogens, especially pathogens associated with respiratory and digestive diseases. The pathogens are especially selected from Aujeszky's disease virus, swine influenza virus (SIV), porcine respiratory and reproductive syndrome virus (PRSV), hog cholera virus (HCV) and Actinobacillus pleuropneumoniae. The vaccines are preferably composed of polymucleotide sequences encoding 3 antigens, all as part of vectors. This sequence represents the coding region for the Aujeszky's disease virus strain NIA3 glycoprotein gB. The sequence was subcloned into the plasmid pVR1012 to generate plasmid pAB090 for
                                                                                    2474
                                                                                                                                          2414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Multivalent vaccine; pig; pathogen; respiratory disease; SIV; PRRSV; HCV: disease; Alvjeszky's disease virus; pseudorabies virus; vaccine; suid herpesvirus 1; swine influenza virus; hog cholera virus; vector; porcine respiratory and reproductive syndrome virus; glycoprotein; SIRSV; swine infertility and respiratory syndrome virus; Actinobacillus pleuropneumoniae; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Multi-valent polynucleotide vaccines against porcine pathogens consist of at least 3 plasmids able to express protective antigens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                           The invention relates to a multivalent vaccine for protecting pigs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Example 8; Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (INMR ) RHONE MERIEUX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19-JUL-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19-JUL-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23-JAN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FR2751224-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pseudorabies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Aujeszky's disease virus glycoprotein gB gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         V49291 standard; DNA;
  221
                                                        161
                                                                                                                 101
                                                                                                                                                                      41
                                              cggagcttcccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagc
                                                                                                togacacccggttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcg
                                                                                                                                         tgctggtgctggcctggtcgcggccttcctggcctaccggcacatctcgcgcctgc
                                                                                                                                                       tccccgagttttctgagctgttcgcggccttcccgtcattcgccggactccggcccacct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       specified viruses
tgaccatcaaggccgagcgcaccgagcagaaggac
                          tcgacgaaggcgacgtggacgaggccaagctggaccaggcccgggacatgatccggtaca
                                                                                gccgcaaccccatgaaggccctgtaccccgtcacgacgaagacgctcaaggaggacggcg
                                                                                                                                                                                                 106; Conservative
                                                                                                                                                                                                                                                                       2742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          virus
                                                                                                                                                                                                                                                                       B₽;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96FR-0009338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               96FR-0009338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /*tag= a
/product=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
1..2742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /*tag=
                                                                                                                                                                                                                                                                       416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63pp;
                                                                                                                                                                                                               9.48;
                                                                                                                                                                                                                                                                       A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          French
                                                                                                                                                                                                                                                                       1024 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "glycoprotein
                                                                                                                                                                                              Score 40.6; D; Pred. No. 0.06
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ВЪ
                                                                                                                                                                                                                                                                      928 G;
                                                                                                                                                                                                                                                                       374 T; 0
                                                                                                                                                                                                                .063;
                                                                                                                                                                                                                            DB
                                                                                                                                                                                                   109;
                                                                                                                                                                                                                            19;
                                                                                                                                                                                                                                                                       other;
                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                          Length 2742;
                                                                                                                                                                                                 0,
                                                                                                                                                                      100
                            2593
                                                                                                                                         2473
                                                                                2533
                                                                                                              160
                                                                                                                                                                                                 0;
```

```
Qy
                                                                                                δÃ
                                        B
                                                        δÃ
                                                                             DЪ
                                                                                                                     Вр
                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                          Query Match
Best Local S
Matches 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2594
                                                                                                                                                                                                                             The sequence is that encoding Thermus thermophilus class II (apurinic/apyrimidinic) endonuclease which retains activity subjected to elevated temperatures for the time necessary to effect denaturation of double-stranded nucleic acids.
                                                                                                                                                                                                                                                                                                New recombinant DNA encoding heat stable AP endonuclease - ar derived vectors, host cells and proteins, useful for nucleic amplification by ligase chain reaction
                                                                                                                                                                                                                                                                                                                                                  WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Class
                                                                                                                                                                                                            Sequence 1108
                                                                                                                                                                                                                                                                              Claim 4; Fig 1A;
                                                                                                                                                                                                                                                                                                                                                                                        (ABBO )
(CHAD )
                                                                                                                                                                                                                                                                                                                                                                                                                      31-MAR-1992;
16-APR-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q49396;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q49396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14-0CT-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Thermus thermophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Apurinic/apyrimidinic; recombinant; heat stable;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27-APR-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                    30-MAR-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WO9320191-A
  415
                    203
                                        355
                                                          143
                                                                              295
                                                                                                                     235
                                                                                                 83
                                                                                                                                       23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7
                                                                                                                               gccacccgcggtccctcttccccgagttttctgagctgttcgcggccttcccgtcattcg
gggtggagtacgtggtcgtccaccccggctcgggccgccccgagcgg
           ggcgctacgaggtacgcgggagcttcccggggtcgaccccgacaaggacgtccacatta
                                                                                        ccggactccggcccaccttcgacacccggttgatgcggctggaagacgagatgaaagagg
                                                                                                                   ggcgcccaagggccctctccccggccgaggtggaggccttccgcgccttaagggaggcct
                                                                                                                                                                                                                                                                                                                                                  1993-336899/42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tgtccatcgtgtcggccctcgagcagcaggagcac
                                      agctttgggagaagagcgtggcgagcctggcggacgacctggagaaggccgccctcctcg
                                                                           ccgggggcctgccgccgtgatccacgcctcctacctggtcaacctggggggcggaggggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           II AP
                                                                                                                                                            110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      standard;
                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                      č,
                                                                                                                                                                                                                                                                                                                                                                                         ABBOTT LAB.
CHAKAKI DYEING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           endonuclease
                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                            BP;
                                                                                                                                                                                                                                                                                                                                                                                                                       92US-0869306
                                                                                                                                                                                                                                                                                                                                                                                                                                92US-0860861
                                                                                                                                                                                                                                                                                                                                                                                                                                                    93WO-US03035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                              42pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA;
                                                                                                                                                                                                            170
                                                                                                                                                                   48.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1108
                                                                                                                                                                                                           A; 379 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ВP
                                                                                                                                                        Score 39.8; DI
Pred. No. 0.08
0; Mismatches
                                                                                                                                                           0;
                                                                                                                                                                                                            393
                                                                                                                                                                                                           ე.
                                                                                                                                                                                                           166 T; 0 other;
                                                                                                                                                                     .084;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2628
                                                                                                                                                                             DB 14;
                                                                                                                                                           117;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SS
                                                                                                                                                                             Length 1108;
  461
                                                                                                                                                                                                                                        6
                                                                                                                                                                                                                                                  AP
when
                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                           acid
                                                                                                                                                         Gaps
                                                                                                 142
                                                                                                                     294
                                                                             354
```

0;

```
99999999888
              Ş
                                             밁
                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 121
                                                                                                                                                                                              Three genes (T00591-93) located in the cluster of cephamycin C biosynthesis in N. lactamdurans which encode deacetoxycephalosporin C hydroxylase and two other proteins, which introduce the methoxyl group at C-7 have been isolated and sequenced. The sequence of one of the latter proteins resembles both cholesterol hydroxylases and methyltransferases of different origins acting on hydroxyl groups present in aromatic or quinone-type compounds; both proteins are required for the hydroxylation at C-7 and the transfer of the methyl group from S-adenosylmethionine to the 7-hydroxycephem intermediate. In addition, the isolation, nucleotide sequence, and the characterisation of a gene (T00590) encoding a 3'-hydroxymethylcephem O-carbamoyl-transferase, designated cmcH has been shown.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    T00591;
                                                                                                                                                                                                                                                                                                                                                                                  Claim
                                                                                                                                                                                                                                                                                                                                                                                                           DNA encoding late enzymes involved in cephamycin biosynthesis related proteins, used to transform cells for cephamycin prodn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1995-382998/49.
P-PSDB; R84175.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Coque JJR,
Martin JF;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cephamycin C biosynthesis; cephem-carbamoyltransferase; hydroxylase;
methyltransferase; cluster; cmcH; cmcI; cmcJ; cefF; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ceff (ORF9) encoding 3'-methylcephemhydroxylase
                                                                                                                                                                       Sequence 972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22-APR-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17-APR-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          02-NOV-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO9529253-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           terminator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nocardia lactamdurans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13-APR-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              T00591 standard; cDNA; 972
                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MERI ) MERCK & CO INC.
                                                                       120
                                           45
                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          œ
ccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcg 239
                                                           gctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccgggggtcga 179
                                        gcgccaggacgagttccgcgagtgggcccgccgcggggtcttctacctcaccgggtacgg 104
                                                                                                                                                                                                                                                                                                                                                                                 Page 39; 61pp; English.
                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Enguita FJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                       BP; 165 A; 358 C; 314 G; 135 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   94US-0233605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              95WO-US04801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /*tag* b
/note* "3'-methylcephemhydroxylse"
934..967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /*tag= c
/note= "putative terminator"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                              9.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Fuente JL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BP
                                                                                                  0;
                                                                                                  Score 39.4; D
Pred. No. 0.1;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Liras P,
                                                                                                           DB 16;
                                                                                                  136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Llarena
                                                                                                  Indels
                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ΕJ;
                                                                                                                              972;
                                                                                                  0;
                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                           and
                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
```

```
RESULT
T08693
ID T(
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                    RBS
                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                             RBS
                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                          Cephamycin; cephalosporin; antibiotic;
C-7 hydroxycephem methyltransferase; 3'-methyl
3'-hydroxymethylcephem O-carbamoyltransferase;
                                                                                                                                            RBS
                                                                                                                                                                                                                                                               misc_difference
                                                                                                                                                                                                                                                                                                                                                                                                                                               Cephamycin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     T08693 standard; cDNA; 2672
                 02-NOV-1995
                                                                                stem_loop
                                                                                                                                                                                                                                                                                                                                                                                           Nocardia lactamdurans strain LC411.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-AUG-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    T08693;
                                  WO9529253-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 catgtcgtactcgatgg 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tcttactgtgtcggtgg 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ggtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcat 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgccaccgaacgagaccaccgggtggccaccgacaccgcgatggacttcttcgcccaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggcgctggaggcggaaagcaccgcccaggtcaccaacaccggcacctacaccgactactc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cacggccgaggagaagcaggccgtgaccacgaaggtcccgaccatgcggcgcgggtactc
                                                                                                                                                                                                                                                                                                                                                                                                                                               biosynthetic enzyme gene cluster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                              /label= ORF7
/product= C-7 hy
/note= "(Claim 8
e 504..602
                                                                                                                                                     /*tag= f
/label= ORF8
/product= coupling p
/note= "(Claim 7, pa
                                                                                                                                                                                                                                                                                                           /*tag=
84..794
                                                                                        /*tag= h
/label= ORF9
/product= 3'm
/note= "ceff
                                                                                                                                                                                         /*tag= e
/note= "putative RBS
802..1668
                                                                                                                                                                                                                                                                                                                              /note-
73..80
                                                                                 2634..2667
                                                                                                                           /*tag= g
1692..2624
                                                                                                                                                                                                                    785..789
                                                                                                                                                                                                                                    /note= "translated sequence of bases 503-602
given in the specification do not
                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                    /note= "stem-loop may correspond to
    terminator"
                                                                                                                                                                                                                                                                                                                                               /label=
                                                                                                                                             .678..1685
                                                                                                                                                                                                                                                       /*tag=
                                                                                                                                                                                                                                                                                                   /*tag=
                                                                                                                                                                                                                                                                                                                                                      /*tag=
                                                                                                                                                                                                                                                                                                                                 pcbC
                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                   c
                                                                                                                                                                                                                                                                                                                     b
                                                                                                                                                                                                                            correspond
                                                                                       3'methylcephem-hydroxylase
efF gene (Claim 5, page 39)"
                                                                                                                                                                                                                                                                                                                                      region of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ΒP
                                                                                                                                                                                                                                                                       hydroxycephem methyltransferase n 8, page 40)"
                                                                                                                                                     page 39-40)"
                                                                                                                                                                                                                            6
                                                                                                                                                                                                  for ORF7/ORF8 cotranslation"
                                                                                                                                                                                                                                                                                                                                      pcbC gene"
                                                                                                                                                                                                                                                                                                                                                                                                            3'-methylcephem hydroxylase;
ansferase; ss.
                                                                                                                                                                                                                            the Genetic
                                                                                                                                                                                                                            Code'
                                                              þ
                                                              transcription
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          224
```

17-APR-1995;

95WO-US04801

```
RESULT 10
Q03259
ID Q03259
XX Q03259
XX Q03259
XX Pseudo
XX Pseudo
XX Aujesz
XX Aujesz
XX Reperdo
XX Reperdo
XX Pseudo
                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                          οy
                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SSSSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 121; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     An internal sequence (T08693) of a 5.4 kb BamHI cDNA fragment of the Nocardia lactamdurans cephamycin C gene cluster was isolated from a phage clone using a ceff gene probe. It contains the 3' region of the pcbC gene, open reading frames (ORF7 and ORF8) that code for a 2-component system comprising C-7 hydroxylase methyltransferase (R92152) and a coupling protein (R92153), and the ceff gene (ORF9) encoding 3'-methylcephem hydroxylase (R92154). Another isolated cDNA (T08694) included the downstream cmcH gene (ORF10) coding for 3'-hydroxymethylcephem O-carbamoyltransferase (R92156). These sequences can be used for prodn. of recombinant enzymes useful for industrial-scale cephamycin synthesis.
                                                                                                                                                                                                                                                                                                                                                                                                    1745
                                                                                                                                                                                                                   1985
                                                                                                                                                                                                                                                                1925
                                                                                                                                                                                                                                                                                                           1865
                                               Pseudorabies
                                                                                        Pseudorabies virus glycoprotein gII polypeptide
                                                                                                                                                            Q03259 standard;
                                                                                                                                                                                                                                                                                                                                                        1805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNA encoding late enzymes involved in cephamycin biosynthesis related proteins, used to transform cells for cephamycin prodn.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1995-382998/49.
P-PSDB; R92151, R92152, R92153, R92154.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Coque JJR,
Martin JF;
                                                                     Aujeszky's disease; vaccine;
                                                                                                                 22-JUL-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Disclosure; Fig 3A-C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            22-APR-1994;
                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (MERI ) MERCK & CO
                                                                                                                                                                                                                                                                                                                                                                                                                120 gctggaagacgagatgaaagaggggggcgctacgaggtacgcgggggggttcccgggggtcga 179
                                                                                                                                                                                                                                        360
                                                                                                                                                                                                                                                                          catgtcgtactcgatgg 2001
                                                                                                                                                                                                                               tcttactgtgtcggtgg
                                                                                                                                                                                                                                                              ggcgctggaggcggaaagcaccgcccaggtcaccaacaccggcacctacaccgactactc 1984
                                                                                                                                                                                                                                                                                                        cacggccgaggagaagcaggccgtgaccacgaaggtcccgaccatgcggcgcgggtactc
                                                                                                                                                                                                                                                                                                                                                     cgccaccgaacgagaccaccgggtggccaccgacaccgcgatggacttcttcgcccaagg 1864
                                                                                                                                                                                                                                                                                                                                                                  ccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcg
                                                                                                                                                                                                                                                                                                                                                                                                 gcgccaggacgagttccgcgagtgggcccgccgcgggggtcttctacctcaccgggtacgg 1804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2672 BP; 441 A; 952 C; 901 G; 378 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Enguita FJ,
                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                              virus
                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94US-0233605
Location/Qualifiers
2639..3001
/*tag= a
                                                                                                                                                            DNA; 4897
                                                                                                                                                                                                                                                                                                                                                                                                                                                        9.18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61pp; English
                                                                                                                                                                                                                                        376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fuente JL,
                                                                                                                                                            ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 39.4; DB 16;
Pred. No. 0.13;
0; Mismatches 136;
                                                                   herpes virus; pig; ss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Liras P,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Llarena FJ;
                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 2672;
                                                                                                                                                                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                    359
                                                                                                                                                                                                                                                                                                          1924
                                                                                                                                                                                                                                                                                                                                299
                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
  Qy
                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
```

```
RESULT 11
Z16654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 105; Conserv
                                                                                                                                  Human; gene; gene expression product; diagnosis; therapy; probe; detection; mapping; tissue typing; profiling; forensic; cancer; genetic analysis; colorectal cancer; breast cancer; lung cancer;
                                                                                                                                                                                                                                                                                                       Z16654 standard;
                                                                                                                                                                                                                                                                                                                                                                                            3465
                                                                                                                                                                                                                                                                                                                                                                                                                                                               3405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 4897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The polypeptide may be used as a vaccine to mammals, e.g. pigs, with resistance against
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Disclosure; Fig 1; 21pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1990-038534/06
P-PSDB; R03732.
28-JAN-1999;
                                 05-AUG-1999
                                                                 W09938972-A2
                                                                                                  Homo sapiens
                                                                                                                                                                                                     Human gene expression product
                                                                                                                                                                                                                                      12-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (ALKU ) AKZO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-AUG-1988;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18-JUL-1989;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               07-FEB-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EP353809-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for use
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Immunogenic polypeptide of pseudo-rabies virus -
for use in mammalian vaccine against Aujeszky's
                                                                                                                                                                                                                                                                                                                                                                                                                           221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tccccgagttttctgagctgttcgcggccttcccgtcattcgccggactcccggcccacct 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tgaccatcaaggccgagcgcaccgagcagaaggac 255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgctggtgctggccggcctggtcgcggccttcctggcctaccggcacatctcgcgcctgc 3344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tcgacacccggttgatgcggctggaagacgagatgaaagaggggggcgctacgaggtacgcg 16v
                                                                                                                                                                                                                                                                                                                                                                                        tgtccatcgtgtcggccctcgagcagcaggagcac 3499
                                                                                                                                                                                                                                                                                                                                                                                                                                                           togacgagggcgacgtggacgaggccaagctggaccaggcccgggacatgatccggtaca 3464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtcgcaaccccatgaaggccctgtaccccgtcacgacgaagacgctcaaggaggacggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Z
                                                                                                                                                                                                                                      (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mettemleiter
99WO-US01619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              88EP-0112479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              89EP-0201887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="gII glycoprotein"
                                                                                                                                                                                                                                                                                                         CDNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 594 A; 2052 C; 1495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.0%;
                                                                                                                                                                                                                                                                                                         707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    English.
                                                                                                                                                                                                                                                                                                         ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 39; DB 11;
Pred. No. 0.19;
                                                                                                                                                                                                     cDNA sequence SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Simon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 G; 756 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ŋ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  110; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Lukacs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 provide
Aujeszky's
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 4897;
                                                                                                                                                                                                     ID NO:4124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rhiza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EJ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3404
```

0;

03-APR-1998;

98US-0080666

```
RESULT 12
T66542
                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TXSXEXEXEX BX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       The present invention describes a library of human polynucleotides accomprising the sequences given in 212532 to 217779. Also described is a CC method of detecting differentially expressed genes correlated with the CC cancerous state of a mammalian cell, comprising detecting at least one CC differentially expressed gene product in a test sample from a cell countries of being cancerous, where the gene product is encoded by one CC plynucleotides can be used as a source of priners and probes, which can be used for a variety of purpose, e.g. detection of expression levels, CC mapping, tissue typing or profiling, forensics, genetic analysis and CC detection of polymorphisms. Polypeptides encoded by the polynucleotides CC can be used for raising antibodies for experimental, diagnostic and CC therapeutic purposes. The polynucleotides may also be used to construct arrays for diagnostics (which may be used to determine function of an CC arrays for diagnostics (which may be used to determine function of an CC identify a genetic prediagnosition or susceptibility to a disease such as CC cancer). The polynucleotides of the invention are especially used in the CC diagnosis, prognosis and management of colorectal cancer, breast cancer, CC cancel as an algorithm of an algor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 est Lo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28-JAN-1998;
24-FEB-1998;
31-MAR-1998;
03-APR-1998;
                            50K-cellulase gene of Melanocarpus albomyces
                                                                                                                                                                     T66542 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Crkvenjakov R, Dickson M, Drmanac R, Drmanac S;
Escobedo J, Garcia PD, Garcia V, Giase K, Innis MA;
Jones WL, Kassam A, Kennedy GC, Kita D, Labat I;
Lamson G, Leshkowitz D, Pot D, Randazzo F, Reinhard
                                                                          25-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 1; Page 1954; 2479pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  differentially
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1999-494092/41.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Stache-Crain B, Sudduth-Klinger J, Williams LT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          peptide analogues and antagonists.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Novel human genes and their expression products which differentially expressed in different cell types
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (CHIR ) CHIRON CORP. (HYSE-) HYSEQ INC.
                                                                                                                                                                                                                                                                                     354
                                                                                                                                                                                                                                                                                                                                  201
                                                                                                                                                                                                                                                                                                                                                                                                                        141
                                                                                                                                                                                                                                                                                                                                                                             294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 234 cccctgcccctgtcctacgtccgggcccacctcttcaagctgtggcaccacacgctgca 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                           tatggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagcagaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgccggactccggcccaccttcgacacccggttgatgcggctggaagacgagatgaaaga 140
                                                                                                                                                                                                                                                                                                                                                                                                     9999c9ctac9ag9tac9c9c9gagcttcccg9g9tc9accccgacaaggac9tccacat
                                                                                                                                                                                                                                                                                   ggtgcaccaggagctgcgagaggagctggccaaggtgaagaccctggagggcatcgctgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BP;
                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98US-0072910.
98US-0075954.
98US-0080114.
98US-0080515.
                                                                                                                                                                     DNA; 1894
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            136 A; 162 C; 181 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8.6%;
                                                                                                                                                                     ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 37;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            107 T; 121 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20; Length 707;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              85;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     G
                                                                                                                                                                                                                                                                                     406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                             353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
```

04 04 05

119

ggctggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccggggtcg

0;

1163

59

```
X DR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PR PR PR PR PR PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             XX PD
 Query Match
Best Local S
Matches 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  28-JUN-1996;
17-OCT-1995;
04-DEC-1995;
                                                                                                                                                                                                                                       This DNA molecule encodes a 50 kDa cellulase (W16543) that has endoglucanase and cellobiohydrolase activity (50K-cellulase) from Melanocarpus albomyces ALKO4237. The enzyme can be used over a wide range of pH and temperatures. The gene was obtained by PCR amplification using primers (see T6547-48) based on tryptic fragments (W16546-47) of the isolated enzyme. It has been deposited as DSM 11025 and DSM 11014. The gene can be used to
                                                                                                    be used to bio-stone cotton-containing fabrics or garments, especially denim, or bio-finish textiles containing natural or ma made cellulose-containing fibres. It can also used in detergent, especially to treat cellulosic fibre-containing textiles, to treat wood-derived pulp or fibre or to improve animal feed quality.
                                                                                                                                                                            prepare recombinant 50K-cellulase in transformed host cells, especially Trichoderma reesei. A novel enzyme prepn. includes at least 1 cellulase from Melanocarpus (see also W16542, W16544-45), Myriococcum, Sporotrichum, Mycellophthora or Chaetomium. It can
                                                                                                                                                                                                                                                                                                                                                                                                      DNA encoding 20K, 50K and 50K B cellulase and facilitating protein useful for bio-stoning and bio-finishing cotton fabrics, especially denim, and as detergent for treating cellulosic fibre containing
                                                                          Sequence 1894
                                                                                                                                                                                                                                                                                                                                                             Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 1997-245119/22.
P-PSDB; W16543.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mantylaa A, M
Vehmaanpera J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sig_peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Key
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            50K-cellulase; endoglucanase; cellobiohydrolase; bio-stoning; bio-washing; denim; detergent; textile; pulp; paper; Myriococcus albomyces; Thielavia albomyces; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Elovainio M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17-OCT-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WO9714804-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Melanocarpus albomyces ALKO4237 (CBS
                                                                                                                                                                                                                                                                                                                                                                                            textiles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (PRIM-) PRIMALCO LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24-APR-1997.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           intron
 Local Similarity
les 97; Conser
                                                                                                                                                                                                                                                                                                                                                           Fig 21; 204pp; English.
 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Haakana H, Jout:
Miettinen-Oinonen
                                                                            ВP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 96US-0020840.
95US-0005335.
95US-0007926.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             96WO-FI00550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /*tag= 0
233..293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /*tag= b
916..1596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /codon_start=
839..915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /*tag=
                                                                          361 A; 590 C; 620
             49.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       . 838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Joutsjoki V,
Score 37; DB Pred. No. 0.52
0; Mismatches
 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           À,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Paloheimo M, S
                                                                          G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  685.95)
                                                                            323
                 .52;
                                                                            T; 0 other;
                               18;
100;
                             Length 1894;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Suominen
 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Londesborough
                                                                                                                                                 natural or man-
 0;
 Gaps
```

밁

В QV В Ş

60

180

```
RESULT
Q79921
             Query Match
Best Local Similarity
Matches 113; Conserv
                                                                                                                                                                                       levels constructs for
                                                                                                       The accB and accC genes of Pseudomonas aeruginosa PaO encode the biotin carboxyl carrier protein (BCCP, given in R66743) and biotin-carboxylase (BC, given in R66744) components, respectively, of acetyl-CoA-carboxylase. The genes may be used to modulate lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1343
                                                                                                                                                                    Disclosure; Fig. 4A-E; 48pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1223
                                                                        Sequence
                                                                                                 accumulation in
                                                                                                                                                                                            Increasing lipid levels in plants by modulating malonyl-CoA levels - partic. for oilseed crops, also nucleic acid constructs for expressing acetyl-CoA carboxylase, transgenic plants and peptide prods.
                                                                                                                                                                                                                                                          P-PSDB;
                                                                                                                                                                                                                                                                     WPI;
                                                                                                                                                                                                                                                                                              Best
                                                                                                                                                                                                                                                                                                                                            08-JUN-1993;
                                                                                                                                                                                                                                                                                                                                                                   06-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pseudomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        biotin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Acetyl-CoA-carboxylase; accB gene; accC gene; malonyl-CoA; lipid;
oilseed; transgenic plant; biotin-carboxylase; BC;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              16-JUL-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q79921;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q79921 standard; DNA;
                                                                                                                                                                                                                                                                                                                    (CALJ ) CALGENE
                                                                                                                                                                                                                                                                                                                                                                                                                     W09429467-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      13
                                                                                                                                                                                                                                                                    1995-036492/05.
                                                                                                                                                                                                                                                                                            Έ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcaccgcgggcatgggc 1359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gcaccgagcagaaggac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgcaggacggcaaggtgatcgagtcgtacgtcgtcgacgcgcgggcctgcccggaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      actogotoaacgacgagttotgcgccgccacggggcgccgcgcgctacctcgacctcggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             accccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       carboxyl carrier
                                                                                                                                                                                                                                                          R66743; R66744
                                                                        2760
                                                                                                                                                                                                                                                                                              Knauf
             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               aeruginosa PaO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                        BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ассв
                                                                                                                                                                                                                                                                                                                                            93US-0074121
                                                                                                                                                                                                                                                                                                                                                                    94WO-US06447
                                                                                              transgenic plants.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "encodes the preprotein" 1349..2701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                             /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                       /label=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /*tag=
                                                                        530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and
                         8.4%;
                                                                        A; 962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      accC
                                                                                                                                                                                                                                                                                                                                                                                                                                           "encodes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                255
                                                                                                                                                                                                                                                                                                                                                                                                                                                         accc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   accB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein; BCCP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     genes
             0,
                         Score 36.4;
Pred. No. 0
                                                                        C; 835
                                                                                                                                                                                                                                                                                                                                                                                                                                           biotin-carboxylase"
             Mismatches
                                                                        <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        biotin
                        4; DB 16;
0.82;
                                                                        433
                                                                        Τ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        carboxyl carrier
             106;
                                                                        0
                                                                        other;
                                   Length
             Indels
                                     2760;
             ω
             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1282
             1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 1
T45143/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Оy
 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H
                                                                                                                      CDS
                                                                                                                                                                       CDS
                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    zeaxanthin; adonixanthin; astaxanthin; crtE; geranylgeranyl pyrophosphate synthase; GGPP synthase; crtB; prephytoene synthase; pyrtycene cynthase; crtI; phytoene des crtY; lycopene cyclase; crtZ; beta-carotene hydroxylase; ds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1826
                                   misc_difference
                                                                                   misc_difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Flavobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Carotenoid; lycopene; beta-carotene; echinenone; canthaxanthin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Flavobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      08-MAR-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              T45143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     T45143 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2003 cagggcaacgccatccacctcggcgaccgcgactgctccctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cccgacaaggacgtccacattatggtccgcgatggtcagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aagtcggccaagctgacccgcaccgaggccggcggcgttcggcaacccgalggtctac 1945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gccaccaccttcccgttcagcgccacccgcggtccctcttccccgagttttctga.actg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ctggagaagttcctgaccaacccgcgccacgtggaagtccaggtgctttccga---cggc 2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttegeggeetteeegteattegeeggaeteeggeecaecttegaeaceeggttgatgegg 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gccgccggcggcggtgggcgcgcggcatgcgcgtggtctacgacgagtccgagctgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            carotenoid biosynthesis cluster DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sp. R1534 WT (ATCC 21588).
                                                                                                                                                                                                                                                                                                                                                                 /*tag= b
/label= ORF~1
2521..3408
                                   8539..8540
                                                                                 /label= ORF-16
8348..8349
                                                                                                                                                                                                                                                                /product= (pre)phytoene complement (4313..5797)
                                                                                                                                                                                                                                                                                                               /product= GGPP synthase complement (3405..4316)
/product= lycopene cyclase complement (6939..7448)
                                                                                                                                                                                                                    /product= phytoene desaturase complement (5794..6942)
                                              /note= "bases 8348-8349
specification"
                                                                                                                    complement (7767..8315)
                                                                                                                                                                                                                                                                                                                                                                                                     /label= ORF-5
1180..2355
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
                                                                                                                                                                                                                                                                                                                              /label= CrtE
/product= GGPP
                                                                                                                                 /product= beta-carotene
                                                                                                                                             /label= CryZ
                                                                                                                                                                                             /label= CrtY
                                                                                                                                                                                                                                            /label= CrtI
                                                                                                                                                                                                                                                                                           /label= CrtB
                                                                                                                                                                                                                                                                                                                                                        /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                             /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ВP
            are
                                                                                                                                                                                                                                                                             synthase
                                                                                                                                 hydroxylase
                                                           are
           given
                                                          given
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 phytoene desaturase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       222
            as
                                                           as
             ממ
                                                           nn
             'n
                                                           in
             the
                                                           <u>-</u>
```

XXXXX

```
οy
                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                            Ş
                                                                                                                            Ъ
                                                                                                                                                                                               Qγ
                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ٩č X
                      V40146/c
ID V40146 standard;
                                              RESULT 15
                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                      Matches
                                                                                4798
                                                                                                                             4858
                                                                                                                                                                          4918
                                                                                                                                                                                                                                                                                                            Genomic DNA (T45143) of Flavobacterium sp. R1534 includes genes of the carotenoid biosynthesis pathway. The sequence was deduced from inserts of 6 clones obtd. from genomic libraries e.g. by PCR amplification (see also T45144-45) and use of partial clones to screen the library. The identities of the gene products (see also W06513-19 and W00871) were detd. by examining carotenoid accumulation in E. coli hosts transformed with deleted variants of the gene cluster. The isolated genes can be used in different
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               misc_difference
                                                                                                                                                                                                                                                                              Sequence 8625 BP; 1458 A; 2898 C; 2964 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Flavobacterium gene sequences encoding carotenoid biosynthesis enzymes - for the production of carotenoid(s), useful in foods
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EP747483-A2
                                                                                                                                                                                                                                                                                                   combinations to produce carotenoids in transformed host cells
                                                                                                                                                                                                                                                                                                                                                                                                                Example 2; Fig 7; 80pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WPI; 1997-023160/03.
P-PSDB; W06513, W06514, W06515,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (HOFF ) HOFFMANN LA ROCHE & CO AG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       29-MAY-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11-DEC-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_difference
                                                                                                      121
                                                                                                                                                   61
                                                                                                                                                                                             1 gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg
                                                                                             ctggaagacgagatgaaagaggggc 145
|}||   ||||||||
                                                                                                                                         GCCGCGATCCTGAACCGGCAGCGCTGGTCGATGTCGCTGTTCGTGCATTTCGGCCTG
                                                                               CTGGTGAACGAGATCTTCAACGGGC 4774
                                                                                                                             TCCAAGCGCCCCGAGAACCTGGCCCACCACAGCGTCATCTTCGGCCCGCGCTACAAGGGG
                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pasamontes L,
                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                95EP-0108888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       96EP-0108556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8602..8604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8590
                        DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note= "bases 8602-8604 are given specification"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /*tag=
                                                                                                                                                                                                                                8.4%;
53.1%;
                        8625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "base 8592 is given specification"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "base 8590 is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "base 8581 is given specification"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        specification"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Tessier M,
                        ВP
                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                Score 36.2; D
Pred. No. 1.2;
                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   W06516,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'TJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Van Loon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   W00871, W06517, W06518,
                                                                                                                                                                                                                                             DВ
                                                                                                                                                                                                                                                                              1295 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              as
                                                                                                                                                                                                                                             18;
                                                                                                                                                                                                                      68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ín
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     as
                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                              10 other
                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nnn
                                                                                                                                                                                                                                             8625;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     in
                                                                                                                                                                                                                                                                                                                                                                                                                                                  foods and
                                                                                                                                                                                                                      0,:
                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W06519
                                                                                                                                                   120
                                                                                                                                                                         4859
                                                                                                                             4799
                                                                                                                                                                                                60
                                                                                                                                                                                                                      0;
```

V40146;

Ş Db QΥ 밁

121

4858

61

δÃ

1

gccaccaccattcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg

GCCGCGATCCTGAACCGGCAGCGCTGGTCGATGTCGCTGCTGCTGCATTTCGGCCTG

120 4859 60

TCCAAGCGCCCCGAGAACCTGGCCCACCACAGCGTCATCTTCGGCCCGCGCTACAAGGGG

4918

Д

CTGGTGAACGAGATCTTCAACGGGC ctggaagacgagatgaaagaggggc 145

4774

Search completed: January 12, 2001, Job time: 26367 sec

20:08:03

```
Matches
                      Query Match
Best Local
                                                                                                                                                                    The invention describes the preparation of carotenoid pigments e.g. canthaxanthins using a cell transformed by a vector having DNA sequences (a) to (e) or substantially homologous sequences. (a) a DNA sequence (crtE) coding GGPP synthase of Flavobacterium sp. R1534; (b) a DNA sequence (crtB) coding prephytoene synthase of Flavobacterium sp. R1534; (c) a DNA sequence (crtI) coding phytoene desaturase of Flavobacterium sp. R1534; (d) a DNA sequence (crtY) coding lycopene cyclase of Flavobacterium sp. R1534, and (e) a DNA sequence (crtW3396) coding beta-carotene beta-oxygenase of a microbe E-396 (FERM BP-4283). The carotenoid or a carotenoid mixture can also be used in preparation of food products.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Carotenoid; pigment; canthaxanthin; R1534; crtB; prephytoene crtI; phytoene desaturase; crtY; lycopene cyclase; GGPP synthase; crtB; crtW2396; beta-carotene beta-oxygenase; food product; fermentation; ds.
                                                                                                             Sequence 8625 BP; 1458 A; 2898 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            02-DEC-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Flavobacterium
                                                                                                                                                        production
                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Preparation of carotenoid -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P-PSDB; W69530,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 02-DEC-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JP10155497-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Flavobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (HOFF ) HOFFMANN LA ROCHE & CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10-AUG-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1998-391048/34
                                                                                                                                                                                                                                                                                                                                                                                                                                            1;
l Similarity
77; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                        Fig
    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                            7-21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sp.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 96EP-0810839
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            97JP-0348653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W69531,
                                                                                                                                                                                                                                                                                                                                                                                                                                      80pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         R1534 nucleotide
                      8.4%;
53.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W69532, W69533,
  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        comprises
                      Score 36.2;
Pred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AG
  Mismatches
                                                                                                             2964 G; 1295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            fermentation with transformed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        W69534.
                                             DB
    68;
                                             19;
                                                                                                             Τ,
                                             Length 8625;
    Indels
                                                                                                               10 other;
    0;
Gaps
    0;
```

\$\times CCCCCCCCCCCX\times T\times T\t

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GenEmbl:*
1: gb_ba1:
2: gb_ba2:
3: gb_om:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-461-774-7
432
1 gccaccacccttco
January 12, 2001, 20:06:54 ; Search time 6876.06 Seconds (without alignments) 321.531 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDENTITY_NUC
Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1118133 seqs, 2558875100 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gb_ba1: *
gb_ba2: *
gb_ov: * *
gb_ov: *
gb_ph: *
gb_pl1: *
gb_pl2: *
gb_pr1: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gccaccaccettcccgttca.....agatccggtccaccaactga 432
                 gb_pr3:
gb_vo:
gb_vo:
gb_vo:
gb_vo:
gb_un:
gb_un:
gb_un:
em_hum2:
em_hum2:
em_on:
em_on:
em_ov:
em_o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2236266
```

	64: 65: 66: 67: 69: 70: 71: 75:	000000000000000000000000000000000000000	755 75 75 75 75 75 75 75 75 75 75 75 75
gb_pr6:* gb_pr7:* gb_sts1:* gb_sts2:* gb_pat1:* gb_pat2:* em_htg0:* gb_htg24:* gb_pr8:*	_htg_htg_htg_htg_htg_htg_htg_htg_htg_htg	9b_htg11: * 9b_htg14: * 9b_htg14: * 9b_htg16: * 9b_htg16: * 9b_htg16: * 9b_htg17: * em_htg4: * em_htg4: * em_htg6: *	m_ht b_ht b_ht b_ht

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

21	c 20	c 19		17	16	15	14	13	12	11	1.0	9	ი 8	c 7	c 6	5	4	c 3	2	1	No.	Result
40.8	41.4	41.6	41.6	41.8	41.8	42	42.2	42.2	42.8	43.2	43.8	44	44.2	44.6	47	47.8	48.2	428.8	428.8	428.8	Score	
9.4	9.6	9.6	9.6	9.7	9.7	9.7	9.8	9.8	9.9	10.0	10.1	10.2	10.2	10.3	10.9	11.1	11.2	99.3	99.3	99.3	Match	Query
12021	38366	13086	1948	3258	2747	3354	2724	399	1750	2748	110000	31636	37521	43349	22800	2982	528	53450	474	474	Match Length DB	
	73	73	73	47	47	73	71	72	Н	73	84	73	73	73	2	1	Н	2	73	2	DB	
AE004848	SC23B6	SC1G2	SPFAMAB	HAKOHE1B	NEUHSP30	SRY15759	AF257079	SHU27483	AF257177	SAUSIGA	LMFLCHR12_14	SC7C7	SC1A8A	SCF41	MTV034	AF134837	AF072875	MTV018	S79751	MSG14KA	ID	
AE004848 Pseudomon	AL390968 Streptomy	AL136500 Streptomy	X61931 S.purpurasc	D26472 Heteroosigm	M55672 Neurospora	Y15759 Streptomyce	AF257079 Pseudorab	U27483 Suid herpes	AF257177 Streptomy	M94370 Stigmatella	Continuation (15 o	AL031031 Streptomy	AL353861 Streptomy	AL117387 Streptomy	AL021929 Mycobacte	AF134837 Amycolato	AF072875 Mycobacte	AL021899 Mycobacte	S79751 14 kda anti	M76712 Mycobacteri	Description	

```
RESULT
MSG14KA
LOCUS
               δÃ
                                                                                                                BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    o o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   c
                                                                                                                                                                                                                                                                                                                                                                             TITLE
JOURNAL
                                           Query Match
Best Local Similarity
Matches 430; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                     AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                   source
               ш
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    40.6
40.6
40.6
40.6
40.2
gccaccattcccgttcagcgccacccgcggttcctttccccgagttttctgagctt
                                                                                                                                                                                                                                                                                                                                                                           Unpublished
                                                                                                                                                                                                                                                                                                                                                                                              The
                                                                                                                                                                                                                                                                                                                                                                                                                     Verbon, A., Hartskeerl, R.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium; Mycobacterium tuberculosis complex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium tuberculosis (library: Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium tuberculosis 14 kD
M76712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14 kD antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 M76712.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MSG14KA
                                                                                                                                                                                                                                                                                                                                                                                                                                 (bases 1 to 474)
                                                                                                                                                                                                                                                                                                                                                                                          Lathigra, R.B.

14K antigen of Mycobacterium
                                           Conservative
                                                                                                                             94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \phi
                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1111112222223334
                                                                                                             /COOK-SOLD-1
/CTAINS!LIABLe=11
/Product="14 kD antigen"
/product="61 149892"
/db_xref="61:149892"
/translation="MATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLED
/translation="MATTLPVQRHPSLF"
/transl
                                                                                                                                                                                                                                                                    /gene="14 kD antigen"
16. .450
                                                                                                                                                                                                                                                                                                      /organism="Mycobacterium tuberculosis"
/db_xref="taxon:1773"
/tissue_lib="lambda-gtll; Loristg:MTB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  184457
3049
11767
25790
42210
2760
5955
40969
26500
1546
2261
1546
2261
1546
2261
1546
2261
1740
184804
41782
41782
41782
41782
41782
41816
                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                    'gene="14 kD antigen"
                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GI:149891
                                                                                                                                                                                                                                                                                                                                                                              (1991)
                                                         99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         474 bp
                                                        7 ZMCABM7
AB016803
AE002014
SCE15
AC036174
SCD8A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3 SC9H11
MKU20446
3 SSPY15518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NLCEFFA
SCG11A
SCC57A
AF089845
SCC88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AE004536
SC2G58
SC1C2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AF079317
A68929
                                           0;
                                                      Score 428.8;
Pred. No. 5.4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STMAFSK1
SCD6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AC009910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SCAFSK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ALIGNMENTS
                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                    Schuitema, A., Kolk, A.H.J., Young, D.B.
                                     5.4e-68;
2;
                                                                                                                                                                                                                                                                                                                                                                                           tuberculosis is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      lambda-gt11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene,
                                           Indels
                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AL391017 Streptomy
AL031124 Streptomy
D15062 Streptomyce
D45382 Streptomyce
AL3558815 Streptomy
AL356592 Streptomy
AL356592 Streptomy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AL049707 Streptomy
AC036174 Homo Sapi
AL160331 Streptomy
Z21687 N.lactamdur
AL133210 Streptomy
AL136519 Streptomy
AF089845 Funaria h
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complete cds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AB016803 Deinococc
AE002014 Deinococc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                M17321 Pseudorabie
AE004536 Pseudomon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Y15518 Streptomyce
X53398 Z.mays cab-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AF079317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AL139298 Streptomy
AC009910 Drosophil
                                                                                                                                                                                                                                                                                                                                                                                           related
                                                                      474;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Loristg:MTB) DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         26-APR-1993
                                           0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sphingomo
                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                           to.
               60
                                           0
```

```
RESULT
S79751
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
ORIGIN
            BASE COUNT
                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 νQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                             REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                       KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                     VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEFINITION
                                                                                                                                                                                                                                                   JOURNAL
MEDLINE
REMARK
                                                                                                                                                                                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                                                                                                                                               ORGANISM
                                                                                                                                                                                                                                                                                                                                               AUTHORS
                                                                                                                                                         gene
                                                                                                                                CDS
                                                                                                                                                                                               source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tccaccaactga 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ttcgcggccttcccgtcattcgccggactccggcccaccttcgacaccccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TCCACCAACTGA 450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CTGGAAGACGAGATGAAAGAGGGGCGCTACGAGGTACGCGCGGAGCTTCCCCGGGGTCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCACCACCCTTCCCGTTCAGCGCCCACCCGCGGTCCCTCTTCCCCGAGTTTTCTGAGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TTCGCGGCCTTCCCGTCATTCGCCGGACTCCGGCCCACCTTCGACACCCGGTTGATGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                  $79751
14 kda an
$79751
$79751.1
                                                                                                                                                                                                                                                                                                                                                     Mycobacterium tuberculosis.

Mycobacterium tuberculosis

Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae;

Mycobacterium; Mycobacterium tuberculosis complex.

1 (bases 1 to 474)

Verbon A Bartsteerl B A Gebuitema A Kolk A H
                                                                                                                                                                                                                                                                J. Bacter
92138631
                                                                                                                                                                                                                                                                                                                   The
                                                                                                                                                                                                                        GenBank staff at the National Library of Medicine created the entry [NCBI gibbsq 79751] from the original journal article. This sequence comes from fig2.
                                                                                                                                                                                                                                                                                                    The 14,000-molecular-weight antigen of Mycobacterium tuberculosis related to the alpha-crystallin family of low-molecular-weight
                                                                                                                                                                                                                                                                                                                                              Verbon, A., Hartskeerl, R.A.,
                                                                                                                                                                                                                                                                                           heat shock proteins
                                                                                                                                                                                                                                                                                                                                 Lathigra
                                                                                                                                                                                                                                                                             Bacteriol.
            94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           antigen [Mycobacterium
            ۵
      /protein_id="AAB21317.1"
/db_xref="GI:244562"
/td=xref="GI:244562"
/translation="MATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLED
EMKEGRYEVRAELPGVDDKDVDIMVRDGQLTIKAERTEQKDEDGRSEFAYGSFVRTV
SLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQIRSTN"
148 c 142 g 90 t
                                                                                                                                /gene="14 kda antigen"
16. .450
                                                                                                                                                                  /organism="Mycobacterium
/db_xref="taxon:1773"
                                                                                        /codon_start=1
                                                                                                                                                                                                             Location/Qualifiers
                                                                                                   note-"This sequence
                                                                                                                  ′gene="14 kda antigen"
                                                                                                                                                                                                                                                                                                                                                                                                                                                     GI:244561
                                                                                                                                                                                                                                                                             174 (4), 1352-1359 (1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         474 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNA
                                                                                                                                                                                                                                                                                                                                            Schuitema, A.,
                                                                                                      comes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tuberculos
                                                                                                                                                                                   tuberculosis"
                                                                                                      from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BCT
                                                                                                                                                                                                                                                                                                                                              Kolk, A.H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Genomic,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              07-MAY-1993
.c, 474 nt].
                                                                                                                                                                                                                                                                                                                                            Young, D.B. and
                                                                                                                                                                                                                                                    this
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     78
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT
MTV018/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             rocus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FERENCE
                                                                                                                                                                                                        REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 430;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local :
                                                                                              JOURNAL
                                                                                                                     TITLE
                                                                                                                                                                                                                                 MEDLINE
                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                               TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 gccaccattcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis H.
ALO21899 AL123456
ALO21899.1 GI:334777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cttactgtgtcggttggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9t9tcgctgccggtaggtgctgacgaggacgttaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCCGACAAGGACGTCGACATTATGGTCCGCGATGGTCAGCTGACCATCAAGGCCGAGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ttcgcggccttcccgtcattcgccggactccggcccaccttcgacaccccggttgatgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TCCACCAACTGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tccaccaactga 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CTTACTGTGTCGGTGGCGGTTTCGGAAGGGAAGCCAACCGAAAAGCACATTCAGATCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTGTCGCTGCCGGTAGGTGCTGACGAGGACGACATTAAGGCCACCTACGACAAGGGCATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CTGGAAGACGAGATGAAAGAGGGGCGCTACGAGGTACGCGCGGAGCTTCCCCGGGGTCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTCGCGGCCTTCCCGTCATTCGCCGGACTCCGGCCCACCTTCGACACCCGGTTGATGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCCACCACCCTTCCCGTTCAGCGCCACCCGCGGTCCCTCTTCCCCGAGTTTTCTGAGCTG
    Direct Submission
Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk
                                                                                                                                                                                                                                                                                      Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Deviin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and Barrell, B.G.
Deciphering the biology of Mycobacterium tuberculosis from the
                                                                                                                                                                                                                                               complete genome sec
Nature 393 (6685),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                   Erratum:[[published erratum appears
12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium.

1 (bases 1 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (bases 1 to 53450)
                                                                                                                                                            bases 1 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99.3%;
                                                                                                                                                              53450)
                                                                                                                                                                                                                                               sequence
5), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 428.8; DB 7
Pred. No. 5.4e-68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  H37Rv complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 73;
                                                                                                                                                                                                        'n
                                                                                                                                                                                                        Nature 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    segment
                                                                                                                                                                                                        Nov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  90/162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                  RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_teature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     available on the World wide Web.

(URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Sene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C.

CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream ribosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         On Jun
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Details of M. tuberculosis sequencing at the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Jun
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="Rv2015c, (MTV018.02c), len: 418. Nearly identical to Mycobacterium tuberculosis Rv1765c(MTCV28.31c, 378 aa), an orf starting next to ISB9, and ending in IS6110. Different N-terminus chosen and C-terminus differs as that of MTCV28.31c has been truncated by IS6110. Does NOTShow similarities with transposes. BLAST hits with non-IS part of MTU78639. FASTA scores: Z95890[MTCY28_31 (378 aa) opt: 2417 z-score: 2553.1 E(): 0; 97.8% identity in 364 aa overlap. TBparse score is 0.939"
                                                                                                                                                                                                                                                                                                                                                      /gene="Rv2016"
1724. .2299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LRLVEAGWDAEVARRPHGQHTTYVMHLDVQERAAGLHLGPLLSESERRYLLCDATFEA
WFERDGQVIGCGRTTRQINRRLRRALEHRDRTCVVPGCGATRGLHAHHIRHWQDGGAT
ELANLVLVCFYHHRAHHRGLITITGPADNLTVADSAGRPLSAGSLARASTKPPPAVAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MSSTATSGAAVVSPAERVEVLFEELAELAGQRNAIDGRIVEIVA ELDRDGLWGVTGARSVAGLVAWKMGCSSGNAHTIATVARRLPEFPRCARGMREGRLSL DQVGVIAGRAGEGSDAHYAQLAGVATVNQLRTALKLEPRPEPEPDFRPEPRPSITRSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(114..1370)
/gene="Rv2015c"
complement(114..1370)
/gene="Rv2015c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="fragment designated v018. Does physical clone"
                                                                IEFWQQGSQPAFPGLEEVRIAVGYRWDPDTREIGAPLLSLRDGKDHVIWVVELDEPAA
GVKITWTPIBPTLPSIDFGDLGEDSGASGER"
                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPGPTGERADWWWYEPFQPQPPPISN"
1715. .1719
                                                                                                                                                                          /transl_table=11
/product="hypothetical protein
/protein_id="CAA17230.1"
/db_xref="01:2896753"
                                                                                                                                                                                                                                                                                      score is 0.927"
                                                                                                                                                                                                                                                                                                                                                                                                    /note="possible
1724. .2299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="hypothetical protein
/protein_id="CAA17229.1"
/db_xref="SPTREMBL:053461"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DEQFSCWRIKLPHVEAAKFDAALQSHLDALIAEYKRDHDNSDGVSDQRPPLPGNVEAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <1. .51145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1. .53450
    /note="possible
                                                                                                                LIHDRIWAHLVTLIASNPGTSIKDKGATREIVVGAHLRLRIKRHHAGDEISTYPTRTA
                                                                                                                                                          /db_xref="SPTREMBL:053462"
                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                               /gene="Rv2016"
/note="Rv2016,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                         'gene="Rv2016"
                                                                                                                                translation="MTELGDKFLAALVGTIRDTRFDIADMRNWRPGWFPTMHSRCLSN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1998 this sequence version replaced gi:2896750
                                                                                                                                                                                                                                                                                                             (MTV018.03),
                                                                                                                                                                                                                                                                                                                                                                                                                           RBS,
    RBS,
ggggga,
                                                                                                                                                                                                                                                                                                                                                                                                                         ggcga,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tuberculosis "
                                                                                                                                                                                                                                                                                                               len: 191. Unknown.
                                                                                                                                                                                                                                                                                                                                                                                                                           for Rv2016"
  for Rv2017"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rv2015c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               not represent
```

```
gene
                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2296. .3336
//gene="Rv2017"
//ote="Rv2017"
//ote="Rv2017"
//ote="Rv2017"
//ote="Rv2017"
//ote="Rv2017"
//ote="Rv2017"
//ote="Rv2017
//ote="Rv2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="Rv2017"
2296. .3327
                           complement (4719.
/gene="Rv2020c"
                                                            QVAARYIASLAAIARAARFPGPFIYTVHPSKIVRVL" complement(4719. .5018)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Rv2018, (MTV018.05), len: 239. Unknown but similar to MTCY339.01c (238 aa). FASTA scores: 277163|MTCY339_1 Mycobacterium tuberculosis cosmid (238 aa) opt: 142 z-score: 175.1 E(): 0.029; 24.08 identity in 250 aa overlap. TBparse score is 0.929. Contains probable helix-turn-helix motif at aa 215-236 (Score 1175, +3.19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /db_xref="Sptrembl:053463"
/translation="mmcIgDVuLAvarkarGLTQIELAELVGLTQPAINRYESGDRDPD
/translation="mmcIgDVuLAvarkarGLTQIELAELVGLTQPAINRYESGDRDPD
QHIVAKLAELICGYTDDLIHGNREFGALAVDAHMRRHKTTKASAWRQLEARLNLLRVH
ASFLFEEVAINSEQHVPAFDPEFTAAEDAARLVRAQWRMPMGPVVNLTRWMEAAGCLV
FEEDFATQRIDGLSQWVDDYPVMLINAMAAPDRKELTLAHELGHLVLHSTNPTEMMET
EATARPAAEFHAPESEIRFELDKLDCKKLLELKREWGVSMQALLARAYRMGLVSAEART
KLYKAMNARGWKTKEPGIESIVREKPSLPAHIGMTLRSRGFTDQQAAAIAGYANPADN
                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="Rv2019"
4287. .4703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QISFADDNLASMIRLPQYGDANVVLDPRRGYGQPVFDGSGVRVADVLGPLRAGATFQA
VADDYGVTPDQLRDALDAIAA"
                                                                                                                         /translation="mQPDRNLLADLDHIFVDRSLGAVQVPQLLRDAGFRLTTMREHYG
ETQAQSVSDHKWIAMTAECGWIGFHKDANIRRNAVERRTVLDTGARLFCVPRADILAE
                                                                                                                                                                                      /transl_table=11
/product="hypothetical protein
/protein_id="CaA17233.1"
/protein_id="CaA17233.1"
/db_xref="G1:2896756"
/db_xref="SPTREMBL:053465"
                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="Rv2019"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="MAGDQELELRFDVPLYTLAEASRYLVVPRATLATWADGYERRPA
NAPAVQGQPIITALPHPTGSHARLPFVGIAEAYVLNAFRRAGVPMQRIRPSLDWLIKN
VGPHALASQDLCTDGAEVLWRFAERSGEGSPDDLVVRGLIVPRSGQYVFKEIVEHYLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
/product="hypothetical
/protein_id="CAA17232.1
/db_xref="GI:2896755"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="Rv2018"
3578. .4297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="possible RBS, 3578. .4297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="PS00142 Neutral zinc metallopeptidases, zinc-binding region signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2884.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PFRPEGGRLHAI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="hypothetical protein
/protein_id="CAA17231.1"
/db_xref="GI:2896754"
                                                                                                                                                                                                                                                                                                                                                                                             /note="Rv2019,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SPTREMBL:053464"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="Rv2018"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                        codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="Rv2017"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .3569
                                                                                                                                                                                                                                                                                                                                                                                          (MTV018.06), len: 138. Unknown"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggagg,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ni protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rv2018
                                                                                                                                                                                                                                                                                               Rv2019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rv2017"
                                                                                                                                                                                                                                                                                                                                                                                   RESULT
AF072875
                                                                                                                                                        SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                        DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                 REFERENCE
                                                                                                                                                                                                                        KEYWORDS
                                                                                                                                                                                                                                                             VERSION
                                                                                                                                                                                                                                                                                                                                                           LOCUS
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16867
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         17227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
```

```
Matches 430;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 gccaccacccttcccgttcagcgccacccgcggtccctcttccccgagttttctgagctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cttactgtgtcggtggcggtttcggaagggaagccaaccgaaaagcacattcagatccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TCCACCAACTGA 16796
                                                                                                                                                                                                                                                                                                                                            tccaccaactga
                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTGTCGCTGCCGGTAGGTGCTGACGAGGACGACATTAAGGCCACCTACGACAAGGGCATT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtgtcgctgccggtaggtgctgacgaggacgtaattaaggccacctacgacaagggcatt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CTGGAAGACGAGATGAAAGAGGGGCGCTACGAGGTACGCGCGGGAGCTTCCCGGGGTCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ctggaagacgagatgaaagagggcgctacgaggtacgcgcggagcttcccggggtcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCCACCACCCTTCCCGTTCAGCGCCACCCGCGGTCCCTCTTCCCCGAGTTTTCTGAGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium.
1 (bases 1 to 528)
Caceres, N.E., Feng,
                                                                                              Mycobacterium smegmatis.
Mycobacterium smegmatis
                                                                                                                                                                       Mycobacterium smegmatis AF072875
                                                         Actinomycetales;
                                                                               Bacteria; Firmicutes; Actinobacteria; Actinobacteridae
                                                                                                                                                      AF072875.1
                                                                                                                                                                                                            AF072875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    regulatory protein similar to M. tuberculosis hypotheticalprotein MTV014.27 (EMBL; AL021646). FASTA hypotheticalprotein MTV014.27 (EMBL; AL021646). FASTA Scores; TR:E1248774 (109 aa) opt: 214 z-score: 302.3 E(). 1.2e-09, 43.0% identity in 107 aa overlap. TBparse score is 0.913. Contains probable helix-turn-helix at aa 45-66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(5103. .5408)
/gene="Rv2021c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
/product="hypothetical protein
/protein_id="CAA17234.1"
/db_xref="GI:2896757"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="Rv2020c,
score is 0.891"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(5103. .5408)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="Rv2021c, (MTV018.08c),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="Rv2021c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="mapgmkwaakTDHLAIVLLPRHHRRHSRRGRALPARSRSALGWI
IERYRVTTDKASGIVNDPNDWCDEHDDPTYIVDLIKKVTTVSVETmkIVDGLAGG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="SPTREMBL:053466"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=:
                                                                                                                                                      GI:5070145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99.3%;
99.5%;
   Feng, Z.,
                                                                                                                                                                                                            528
                                                           Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pred. No. 1.2e-68;
); Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 428.8;
   Li, L. -L.,
                                                                                                                                                                                         putative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (MTV018.07c),
                                                                                                                                                                                       HSP20 (hsp) gene, complete cds.
     Kapur, V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 2;
                                                           Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    len: 101. Unknown,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Rv2020c'
       Cirillo, J.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unknown.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       53450;
                                                                                                                                                                                                              16-JUN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TBparse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    possible
                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            17048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               17168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             16928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     17108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                E():
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
```

```
VERSION
KEYWORDS
                                                                                                                                               RESULT
AF134837
                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JOURNAL
REFERENCE
AUTHORS
                                                   SOURCE
                                                                                                                      DEFINITION
                                                                                                                                   LOCUS
                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE COUNT
ORIGIN
                                                                                            ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                      ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                                                                                                                                               238
                                                                                                                                                                                                                                                                                                                                                                           245
                                                                                                                                                                                                        425
                                                                                                                                                                                                                      352 aagggcattcttactgtgtcggtggcggtttcggaaggg 390
                                                                                                                                                                                                                                                               365
                                                                                                                                                                                                                                                                                          292
                                                                                                                                                                                                                                                                                                                      305
                                                                                                                                                                                                                                                                                                                                                                                                        184
                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                             124
                                                                                                                                                                                                       GCAGGCGTACTGAAGGTACGGGTCGCCGGTGCCTACGCG
                                                                                                                                                                                                                                                                               gttcgcacggtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgac
                                                                                                                                                                                                                                                                                                                                  gacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgag-----
                                                                                                                                                                                                                                                                                                                                                                                                                              GAGGTCACAAGAGACGCTGAGGACGCCGTGGTGTCCGTCGAACTCCCCGGTGTGGATGTC 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                 gaagacgagatgaaagaggggcgctacgaggtacgcgcgggggcttcccgggggtcgacccc 183
                                                                                                                                                                                                                                                             CGCCGTGAGTTCAAGCTGCCCGCGCACGTCACGGGCGACGCGGTCACCGCGTCCTACGAC
                                                                                                                                                                                                                                                                                                                   GACGAACGCTCCGAGGAATCCGACGGCCGCACCTACAGTGAGGTCCGCTACGGCTCCTTC
                                                                                                                                                                                                                                                                                                                                                                          144;
AF134837 2982 bp DNA BCT 14-OCT-1999
Amycolatopsis mediterranei aspartokinase and aspartate-semialdehyde
dehydrogenase operon, complete sequence.
AF134837
                                                                             AF134837.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (18-JUN-1998) Veterinary and Biomedical University of Nebraska-Lincoln, Rm 211 VBS, Fair Campus Loop, Lincoln, NE 68583-0905, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Barletta,R.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Caceres, N.E., Feng, Z.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium smegmatis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Identification of a HSP20 heat shock protein homolog from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MSTLMKTPAVWTRPAWQLDNWVRDFFGPADDWFKGFTPAAEVTR
DGEDAVVSVELPGVDVGKDVNVEVDRGRLVIHGERRDERSEESDGRTYSEVRYGSFRR
EFKLPAHVTGDAVTASYDAGVLKVRVAGAYAGEQPQRIAIESR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="hsp"
65..502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="hsp"
53. .57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /evidence=not_experimental
/product="putative HSP20"
/protein_id="AAD39038.1"
/db_xref="GI:5070146"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="taxon:1772"
53. .502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Mycobacterium
/strain="mc(2)155"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="heat shock protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="hsp"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1
to
                                                                            GI:5733410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          167 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 48.2; DI
Pred. No. 16;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        184 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Li,L.-L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           74 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kapur, V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             smegmatis*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 528;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Cirillo, J.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sciences,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                       351
                                                                                                                                                                                                                                                                                                                   364
                                                                                                                                                                                                                                                                                                                                                                          304
                                                                                                                                                                                                                                                                                                                                              291
                                                                                                                                                                                                                                                                                                                                                                                                     237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     East
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      <u>ب</u>
```

Q

51 ttctgagctgttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccg 110

Matches 164; Query Match Best Local

Similarity

11.1%; 48.4%;

Score Pred.

DB <u>,,</u>

Length 2982; Indels

ω ••

Gaps

Conservative

0;

Mismatches 172; 47.8; No. 11;

```
BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Zhang, W., Jiang, W., Zhao, G., Yang, Y. and Chiao, J. Sequence analysis and expression of the aspartokinase and aspartate semialdehyde dehydrogenase operon from rifamycin SV-producing amycolatopsis mediterranei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Submitted (13-MAR-1999) Microbiology,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 (bases 1 to 2982) 
Zhang,W., Jiang,W.H., Zhao,G.P., Yang,Y.L. and Chiao,J.S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Physiology, Academia Sinica,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99453302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (bases 1 to 2982)
                      472
                                                                           /translation="MADGLRVGVVGATGOVGAVMRKLLAEREFPIAELRYFASARSAG
KLPWROTEITIEDASTRADESGLDIALESAGGSTSKAQAPRFAAAGVTVJINGSAFRM
DPDVPLVVSEVNPEAVKEARKGIIANEPUCTTIAAMPVLKPLHDEAGLVRLVASTYQA
SGSGLAGVDELAGQVRAAAEHASLLTHGGAALDEPKPEKYVRPIAFNVLPMAGSIVDD
GEFETDEEKKFENESRKILSIPGLAVSGTCVRVPVFSGHSVSVNAEFERPLSVERATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MALVVQKYGGSSLESADRIKRVAERIVATKKAGNDVVVVCSAMG
DTTDELLDLAQQVNPAPPEREMDMLLTAGERISNIVAMAIAAQGAEAWSFTGSQAGV
VTTSVHGNARIIDVTPSRVTEALDQGYIALVAGGAGAVTKDITTLGRGGSDTTAVA
LAAALMADVCEIYSDVDGVYTADPRVVPDAKKLDTVTYEEMLELAASGSKILHLRSVE
YARRYGVPIRVRSSYSDKPGTTVTGSIEEIPVEQALITGVAHDRSEAKITVTGVPDHT
GAAARIFRVIADAEIDIDMVLQNVSSTVSGRTDITFTLSKANGAKAVKELEKVQAEIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     967.
                                          AIQIAELVAQQL'
                                                                                                                                                                                                                                                                                                                                                              /translation="MEQALITGVAHDRSEAKITVTGVPDHTGAAARIFRVIADAEIDI
DMVLQNVSSTVSGRTDITFTLSKANGAKAVKELEKVQAEIGFESVLYDDHVGKVSVVG
AGMRSHPGVTATFCEALAEAGVNIEIINTSEIRISVLIRDAQLDDAVRAIHEAFELGG
                                                                                                                                                                                           QLDDAVRAIHEAFELGGDEEAVVYAGSGR"
                                                          LLTHAPGVELSEEPTPLQAAGNDPSYVGRIRVDPGVEGGRGLALFLSNDNLRKGAALN
                                                                                                                                                                                                                                                                                                                           1485.
                                                                                                                                                                                                                                                                                                                                               DEEAVVYAGSGR"
                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
/product="aspartokinase subunit
/protein_id="AAD49568.1"
/db_xref="GI:5733412"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FESVLYDDHVGKVSVVGAGMRSHPGVTATFCEALAEAGVNIEIINTSEIRISVLIRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /trans1_table=11
/product="aspartokinase
/protein_id="AAD49567.1"
/db_xref="GI:5733411"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        dehydrogenase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Amycolatopsis
/strain="U32"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                            /codon_start=1
                                                                                                                                                                                                                                                                                                    /note="Orf3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="Orf2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="askA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="askA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="aspartokinase and
dehydrogenase operon"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="taxon:33910"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="askA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .1485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 413-419 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .1485
                      C
                 1072 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300 Fenglin
                      442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subunit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aspartate-semialdehyde
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 mediterranei"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Shanghai Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Α,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Road,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Shanghai,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Plant
1 200032,
```

```
RESULT
MTV034/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       an.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTACGAAGATGCTCGAGCTCGCCGCGAGCGGGTCGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgacaagggcattcttactgtgtcggtggcggtttcgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TTCGCAGGCCGGCGTCACGACGTCGCTGCACGCCAACGCGCGATCATCGACGTCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGGTGTGTACACGGCGGACCCGCGGGTGGTGCCGGACGCGAAGAAGCTCGACACCGTCAC 809
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGCCGTCGCCGCGCGCGCGCGCGAAACGCCGACGTCTGCGAGATCTACTCCGATGTGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      caaggccgagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgtacggttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGGCGTCGCGCAGGACACCAAGGACATCACCACGCTGGGCCGGCGGCGCGCTCGGACACCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cggggtcgaccccga---caaggacgtccacattatggtccgcgatggtcagctgaccat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCCGAGCCGGGTCACCGAGGCGCTCGACCAGGGGTACATCGCGCTGGTGGCGGGCCTTCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 (bases 1 to 22800)
1 (bases 1 to 22800)
Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C.,
Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E.,
Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T.,
Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S.,
Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J.,
Moule, S., Murphy, L., Oliver, S., Osborne, J., Quall, M.A.,
Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S.,
Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and
Barrell, B.G.
                                  been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct
                                                                                                                                                                                                                                                                                                                                                                                                     tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 20, 1998 this sequence version replaced gi:2909438.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis H37Rv
AL021929 AL123456
AL021929.1 GI:3242291
                                                                                                                                                                                                                                                                                                                                 Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Erratum:[[published erratum 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MTV034
                                                                                                                                                                                                                                                                                                  (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Parkhill
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complete genome sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Deciphering the biology of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 22800)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22800
   Where possible we choose an initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               appears
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complete genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nature 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tuberculosis from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        segment 13/162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      689
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upst
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein, similar to Mycobacterium tuberculosis MTCY07D11.18c(228 aa) and MTCY10G2.30c (197 aa). FASTA scores 2951201MTCY7D11_18 (228 aa) opt: 266 z-score: 346.6 E(): 8.3e-12; 28.18 identity in 196 aa overlap. TBparse score is 0.876"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="Rv0237, (MTV034.03), len: 388. Lipoprotein similar to ALTEROMONAS SP. BETA-HEXOSAMINIDASE A PRECURSOR (598 aa) and Synechocystis sp. PCC6803 sptr|P74340|P74340| BETA-GLUCOSIDASE (538 aa). Contains signal sequence and appropriatelypositioned PS00013 Prokaryotic membrane lipoprotein lipidattachment site. FASTA scores
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1414.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (598 aa) opt: 415 z-score: 439.1 E(): 5.8e-17; identity in 343 aa overlap; and sptr[P74340]P74340 BETA-GLUCOSIDASE (538 aa) opt: 414 z-score:438.7
                                                                                                                                                                                       2102.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="possible
1426. .2040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MAFPRFLAILAAAAALVVACSHGGTPTGSSTTSGASPATPVAVPVRSCAEPAGIPALISPRDKLAQLLVVGVRDAADAQAVVTNYHVGGILIGSDTDLTIF
DGALAEIVAGGPLPLAVSVDEEGGRYSRLRSLIGGTGPSARELAQTRTYQQVRDLAR
DRGRQMRKLGITIDFAPVVDVTDAPDDTVIGDRSFGSDPATVTAYAGAYAQGLRDAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      spl948823|HEXA, ALTSO BETA-HEXOSAMINIDASE A PRECURSOR (
1100 PROCESSION (1997) | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 | 1997 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="lpqI"
184. .1350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       physical clone"
184. .1350
/note="Rv0239, (MTV034.05), len: 77. Unknown but similar
to Mycobacterium tuberculosis protein MTCY359;34 (87 aa).
                                                                                                                                                                                                                             GAGEAVATRLGIGDTDVDEAAEMMINLFWLGLKGAPVDRLETGH"
                                                                                                                                                                                                                                                                                                      SKPMLYLYYGSKEDLFGACLNREMSRFIDALRSSINFDQSPKDLLRNTIVSFLRYIDA
                                                                                                                                                                                                                                                                                                                                                                                                         /product="hypothetical
/protein_id="CAA17330.:
/db_xref="GI:2909442"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="Rv0238"
1426. .2040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         attachment site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGADTALWVTTKEVPAVLDRLEQALRAGELPMSAVDRSVVRVATMKGPNPGCGR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LPVLKHFPGHGRGSGDSHNGGVTTPPLDDLVGDDLVPYRTLVTQAPVGVMVGHLQVPG
LTGSEPASLSKAAVNLLRTGTGYGAPPFDGPVFSDDLSGMAAISDRFGVSEAVL<sub>K</sub>TLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="lpqI"
/protein_id="CAA17329.1"
/db_xref="GI:2909441"
                                                                                                                                             /gene="Rv0239"
                                                                                                                                                                                                                                                            NRASWIYMYTQATSSQAFAHTVREGREQIVQLVAELVRAGTRGPLTDAEIEMMAVALV
                                                                                                                                                                                                                                                                                                                                 /translation="MAGGTKRLPRAVREQQMLDAAVQMFSVNGYHETSMDAIAAEAQI
                                                                                                                                                                                                                                                                                                                                                                   /db_xref="SPTREMBL:053661"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Rv0238, (MTV034.04), len: 204. Possible regulatory
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="Rv0238"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="PS00013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="SPTREMBL:053660"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        is 0.890"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="lpq1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="fragment designated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .22800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .1419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30.6% identity in 320 aa overlap. TBparse score
                                      (MTV034.05),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Prokaryotic
                                                                                                                                                                                                                                                                                                                                                                                                                                               ll protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aagggg,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tuberculosis'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               membrane lipoprotein lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                v034. Does not represent a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for Rv0238"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Rv0238"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the most upstream
```

```
complement(2810...3652)
/gene="Rv0241c"
complement(2810...3652)
/gene="Rv0241c"
/note="Rv0241c"
/note="Rv0241c, (MTV034.07c), le
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(3661..3664)
/note="possible RBS, ggag, fcomplement(3663..5027)
/gene="fabG4"
complement(3663..5027)
                                                                                                                                                                                                                                                                                                                                                                                                                               aa) Opt: 304 & SCULT VICTORIAN AND CONTROL Store: 584; 44.4% identityin241aa overlap; and U39441 VHU39441_2 Vibrio harveyi malony1-CoA:ACP tr (244 aa) opt: 562 z-score: 640.7 E(): 3.4e-28; 40.2% identiin 241 aa overlap. TBparse score is 0.872°
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="RV0242c, (MTV034.08c), len: 454.fabG4, Probably /note="Rv0242c, (MTV034.08c), len: 454.fabG4, Probably 3-0x0AcyL-[AcYL-CARRIER PROTEIN] REDUCTASE as C-terminal part highlysimilar to various FabG proteins e.g. 039441 VHU39441_2 (244 aa). Has N-terminal extension of 200 aa and C-terminal part contains PS00061 Short-chain dehydrogenases/reductasesfamily signature. FASTA scores 091631 PAU91631_3 Pseudomonasaeruginosa PLsx prote (247 aa) opt: 542 -score: 665.4 E(): 1.5e-295mith-Waterman 2.5e-255mith-Waterman 2.5e-255mith
/db_xref="sptrembl:053665"
/translation="markrssdlfsquvnsgpgsflarqlgvpqpetlkryrageppl
/translation="markrssdlfsquvnlggrwadsfgglvfdatgttepaglkgl
TGSLLIGGAGRVVEPLRAALEKDVDLVGNNLGGRWADSFGGLVFDATGTTEPAGLKGL
HEFFTPYLRNLGRCGRVVVVGGTPEAAASTNERIAQRALEGFTRSLGKELRRGATTAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                aa) opt: 5
score: 584;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VRGL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /trānslation="MTOPSGLKNLLRAAAGALPVVPRTDQLPNRTVTVEELPIDPANVAAYAAVTGLRKGNQVELTYPEALKITPSVMSLVTGEDFDFAAMAAIHTENHITQYXBIAVTDLXKGVARDVTFLHQQXTSLSGEBKPBVTDAVGVRVTFLHQCRTSLSGEBKPBPPQKKPKLPPPAAVLRITPAKIRRYAAVGGDHNPIHTNPIAAKLFGFPTVIAHGMFTAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="hypothetical
/protein_id="CAA17333.1
/db_xref="GI:2909445"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ELYQLLRNPTVYTRPLEGPEAAEVCQTFRRNRRWALLENAPVMNEVWYLAATPRIARR RLFDARLALTLRHHGVDEFATRNINGFTDFGFSRVWDPITSDG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2343. .2780
/gene="Rv0240"
/note="Rv0240, (MTV034.06),
score is 0.930"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="hypothetical protein Rv0239"
/protein_id="CAA17331.1"
/db_xref="GI:2909443"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FASTA scoresz83859|MTCY359_34 (87 aa) opt: 135.1 E(): 5; 40.0% identity in 45 aa ove
                                                                                                                                                                                                /protein_id="CAA17334.1"
/db_xref="GI:2909446"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="hypothetical protein Rv0240"
/protein_id="CAA17332.1"
/db_xref="GI:2909444"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="Rv0240"
2343. .2780
                                                                                                                                                                                                                                                                                                     /product="fabG4"
                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="fabG4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AVLANTEARFPDAVRYSVRFAKPVLLPATAGLYVAEGDGGWDLTLRNMAKGYPHLTAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="SPTREMBL:053664"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        translation="MLSIDTNILLYAQNRDCPEHDAAAAFLVECAGRADVAVCELVLM/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="SPTREMBL:053663"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RDAASDTWQPPTPRRLGPFRASEETWRELANEA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="SPTREMBL:053662"
/translation="MIRTQVQLPDELYRDAKRVAHEHEMTLAEVVRRGLEHMVRIYPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  score is 0.922"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein Rv0241c'
1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for Rv0241c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   145. Unknown. TBparse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         280. Unknown TBparse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pt: 88 z-score:
overlap. TBparse
```

밁

LOCUS

Вр Qy 밁 Qγ 밁 Qy В ρy В Ş В QΥ

gene

CDS

gene

CDS

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
SCF41/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                          SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DEFINITION
                                                                                                                                                                 REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Sim
Matches 174;
                                                                                                                   JOURNAL
                                                                                                                                           AUTHORS
                                                                                                                                                                                            MEDLINE
                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM
                          JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15183 CATCA 15179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15303 CCGGCTGCCCGCGCACGTCACCAGCGAGGCCATCGCGGCTTCCTATGACGCCGGTGTGCT 15244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gtcgctgccggtaggtgctgacgaggacgaccattaaggccacctacgacaagggcattct 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ggaagacgagatgaaagaggggcgctacgaggtacgcgggggggtctcccgggggtcgaccc 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CGGAGACTTCACGCCGGCCGCCGAGATCGTCAAGGATGGCGACGACGCGGTGGTCCGTTT 15478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cacca 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGGAGACAAAGACGGCCGCACCCTGCGTGAGATCCGCTACGGATCATTCCGCCGCTCGTT 15304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----GGTGAGCCGCCTGGTGATCCGCGGCGAACACCGCGACGAGCACACGCAAGACGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cyaccaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgcac 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGAACTGCCCGGCATTGACGTCGACAAGGACGTCAACGTCGAGCCTTGACCCTGGCCAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcggct 122
                                                                                                                                                                                                          Kinashi,H. and Hopwood,D.A.
A set of ordered cosmids and a detailed genetic and physical map
for the 8 Mb Streptomyces coelicolor A3(2) chromosome
Mol. Microbiol. 21 (1), 77-96 (1996)
                                                                                                                                                                                                                                                                                                                                                                       Streptomyces coelicolor A3(2).
Streptomyces coelicolor A3(2)
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AL117387.1 GI:5881910
2-hydroxyhepta-2,4-diene-1,7-dioate isomerase; ABC transport protein; binding-protein -dependent transport protein; dehydrogenase; enoyl Co-A hydratase; GntR family DNA-binding
Submitted (13-SEP-1999) Streptomyces coelicolor sequencing project, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge
                                                Direct Submission
                                                                     Thomson, N.R.,
                                                                                                                                                                                                                                                                                                      1 (bases 1 to 43349)
Redenbach, M., Kieser,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                regulator; IclR family regulator; Insertion element IS1649; integral membrane protein; inverted repeat; LacI family regulator; oxidoreductase; racemase; secreted protein; solute-binding protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Streptomyces coelicolor AL117387
                                                                                                              Unpublished
                                                                                                                                         Saunders, D.C. and Harris, D.
                                                                                                                                                                                                                                                                                                                                                                                                                                               Transposase.
                                                                                                                                                                                                                                                                                                                                                      Actinomycetales;
                                                                                           (bases 1 to 43349)
                                                                                                                                                                 (bases 1 to 43349)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(3903.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISEHLRDHHGGKADILVNNAGITRDKLLANMDDARWDAVLAVNLLAPLRLTEGLVGNG
SIGEGGRVIGLSSIAGIAGNRGQTNYATTKAGMIGITQALAPGLAAKGITINAVAPGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="fabG4"
/note="PS00061 Short-chain dehydrogenases/reductases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IETQMTAAIPLATREVGRRLNSLLQGGQPVDVAEAIAYFASPASNAVTGNVIRVCGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                43349 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10.9%;
                                                                     Parkhill, J., Barrell, B.G. and Rajandream, M.A.
                                                                                                                                                                                                                                                                                                      Kieser, H.M., Denapaite, D., Eichner, A., Cullum, J.,
                                                                                                                                                                                                                                                                                                                                                    Streptomycineae; Streptomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 47; DB : Pred. No. 7.8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches 185;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          F41.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 22800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <del>|</del> ;
```

```
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RBS
RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         are also included but some of these may be fortuitous. The length in codons is given for each CDS. Usually the highest scoring march found by fasta -o is given for CDS which show significant similarity to other CDS in the database. The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon. Gene prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., using a specially developed Hidden Markov Model (Krogh et al., Gene 30:157-66(1984) as implemented at program of Bibb et al., Gene 30:157-66(1984) as implemented at the control of the second of the seco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     upstream initiation codon.
IMPORTANT: This sequence MAY NOT be the entire insert of the sequenced clone. It may be shorter because we only sequence overlapping sections once, or longer, because we arrange for small overlap between neighbouring submissions.
Cosmid F41 Lies between and overlaps with cosmids F12 and F62 the AseI-F genomic restriction fragment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the movement of the codon of th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (URL; http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are numbered using the following system eg SC7B7.01c. SC (S. coelicolor), 7B7 (cosmid name), .01 (first CDS), c (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      David A. Hopwood, [3] John Innes Centre, Norwich Research Park, Colney, Norwich, Norfolk NR4 7UH, UK Notes:

Streptomyces coelicolor sequencing at The Sanger Centre is funded by the BBSRC and Beownlf Genomics
Details of S. coelicolor sequencing at the Sanger Centre are available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 strand).
The more significant matches with motifs in the PROSITE database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. d A. Hopwood, [3] John Innes Centre, Norwich Research Park,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /db_xref="taxon:100226"
/clone="cosmid F41"
complement(1. .1050)
/gene="SCF41.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(1056. 1151. .1154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VNRTVELDDRDSGAGGHQVVYRSYDGPGKARVTGAEPVTGWEEYKDGIYRADVGTDNP
FYTLFEDGTRATTARYPNRKSEEEWAPYLTSTLPEPEKEAVHQWLYSNPGDWDATWDL
GNAQAVVWSGGSWSWFTDTVPIRDWNPAKNQMTLKYWTRYALNNSGGGSRYFLQNSLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="nominal overlap with StF12"
complement(<1. .1050)</pre>
                                                                                                                    /gene="SCF41.02"
/note="SCF41.02, unknown, len: 113 aa. Contains a PS00197
2Fe-2S ferredoxins, iron-sulfur binding region signature."
                                                                                                                                                                                                                                                                                                                                  /gene="SCF41.02"
1158. .1427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ALOYTOFVDWYRNGWI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RATELFVSPDGNDKAKGTKDKPFKTIEKARDHIRDKGLNRPGRMRCDIHVNLRAGDYP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sequence."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="SCF41.01c, partial CDS, possible secreted protein,
len: >350 aa. Contains a possible N-terminal signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FLDQAGEYYLDFKKGQLYYKPRGDIDDVTVLRPTVKTLFDLAGTAPDRRVQNVTLDGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Streptomyces
/strain="A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="SCF41.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .43349
                                                                    _start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .1060)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         coelicolor A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            because we arrange for a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                F12 and F62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        choose the most
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_feature
gene
                                                                                                                                                                                                                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
```

```
/note-"SCF4I.03, possible GntR family DNA-binding regulator, len: 414 aa. C-terminus similar to Streptomyces coelicolor TR: 092B59 (EMBL; AL034446) putative GntR family transcriptional regulator SCIA9.23 (273 aa), fasta scores opt: 332 z-score: 363.0 E(): 7.2e-13.31.9% identity in 254 aa overlap. The N-terminus is weakly similar to other DNA-binding proteins e.g. Clavibacter michiganensis subsp. sepedonicus TR:086023 (EMBL; AF079817) putative transposase (320 aa), fasta scores opt: 158 z-score:0.0 E(): 0.0 30.04% identity in 233 aa overlap. Contains a Ffam match to entry PF00392 gntR, Bacterial regulatory proteins, gntR family. Contains two potential helix-turn-helix motifs: between aa 135.156 score (+5.36 SD) and residues 69.90 score (+4.14 SD)."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="putative GntR family DNA-binding regulator"
/protuctin_id="CAB55706.1"
/protein_id="CAB55706.1"
/db_xref="Gi:5881913"
/translation="MTKGATNSRPVSHKFTHPRKRGAMTDPVLPEFPQLSAEDRAALA
ELARRQAGLELERGRIVLACABGLTNAEVAGRLTVSFTTVAKWERFYLLRGGLAGLHDA
PRSGRPRSSNRGAEARIAAVVEQARAGAPVESTRSLEDTIGLSOSTVARIUREQEBA
PRSGRPRSSNRGAEARIAAVEQARAGAPVESTRSLEDTIGLSOSTVARIUREQEBA
ELERPDGRPSRPRGAADGGEGGEASRTRGGPVEGTPRWPRQLLSDHVYALLROWIVSG
RLAPGGRLVESELARGFGTSQAPPREAIKRLAYEGLVISQPHRGTYVAQVSERQAQDI
RDIRVMFEEYAARRVAGRLDAEHTRLLAEDVTRLRRAAAEDDIGAFRDADMSFHRHVC
EAARNAALITLWRMIESSLWDLHVLGDDRYAGGWGAMAEHHAELLDVLRSGDPDAAGP
BEADHAAGETARYLTDGSGPAT"
                                                                                                                                      /transl_table=11
/product="probable IclR family regulator"
/protein_id="cab55707.1"
/protein_id="Cab55707.1"
/db_xref="g1:5881914"
/translation="MSTRDGSVWASAAPAPAVLRAGAILDALADARGRALSPAQLAAA
/translation="MSTRDGSVWASAAPAPAVLRAGAYLDAFDPVRSFREQVSR
/GGIPRASVVNICAALREQELVHAVDGGFALGPGLARIALGACYDAFDPVRSFREQVSR
LGDREETIQLATMDGADVYLLAVBGGTVLMRLTSRAGARLPVTCTALGXAMLAGLDVSR
LGDREETIQLATMDGADVYLLAVBGGTVLMRLTSRAGARLPVTCTALGXAMLAGLDVS
GVCELLASREPFEARTWSLTTLDALLAEVREVRTAGHAVDDQEAAEGIVCVAAAVPG
PAGGGRSFAVSSSLKSEATPERVAELAALIKGVVRRWGGAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     aa. Similar to many e.g. Agrobacterium tumefaciens TR:AAA43987 (EMBL; U59485) AttJ (275 aa), fasta scores opt: 354 Z-score: 406.3 E(): 2.8e-15 31.6% identity in 237 aa overlap and Streptomyces coelicolor TR:CAB45040 (EMBL; ALO78655) putative transcriptional regulator (248 aa), fasta scores opt: 333 Z-score: 383.3 E(): 5.3e-14 32.3% identity in 248 aa overlap. Contains a Pfam match to entry
complement(2769. .3329)
/gene="SCF41.04c"
/note="Pfam match to en
E-value 1e-21"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(2763. .3545)
/gene="SCF41.04c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene-"SCP41.03"
/note="Pfam match to entry PF00392 gntR, Bacterial
regulatory proteins, gntR family, score 54.90, E-value
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /translation="MRKPELEPEPDGSRNRSRCGSRNRRHGSRCRAGPCSGCGGFVPS
SGGVAPVADAVRSGMGRGPPLRTPAPVEHPHGIAYTISGSLIEQR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PF01614 IclR."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(2763.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2099.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /protein_id="CAB55705.1"
/db_xref="GI:5881912"
/tanal=*id=""."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2e-:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="SCF41.03"
/note="SCF41.03,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1481. .2725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="SCF41.02"
/note="PS00197 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="SCF41.04c, probable IclR family regulator, len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="SCF41.04c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1481. .2725
/gene="SCF41.03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              region signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                codon_start-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2Fe-2S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .3545)
                                      to entry PF01614 IclR, ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ferredoxins,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    iron-sulfur binding
                                          score 85.60,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              260
```

```
RESULT
SC1A8A/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                     SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches 131;
                                                                                                                                            TITLE
                                                                                                                                                                                                                                                 AUTHORS
                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         671 ACGGCCCGGCAAGGCCCGCGTGACGGGCGCCGAG 637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttcgcacggtgtcgctgccggtaggtgctgacgag 327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccgagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgtacggttccttcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGAGCTGTTCGTGTCCCCCGACGGGAACGACAAGGCCAAAGGCACGAAGGACAAGCCCT 852
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ctgagctgttcgcggccttcccgtcattcgccggactccggcccaccttcgacacccggt 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TCGAACTCGACGACCGCGACTCGGGCGCCGGTGGCCACCAGGTCGTCTACCGCTCCTACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGATGCGCTGCGACATCCACGTCAACCTGAGGGCCGGCGACTACCCGGTGAACCGGACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCAAGACCATCGAAAAGGCCCGCGACCACATCCGCGACAAGGGTCTCAACCGGCCCGGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcgcggagcttcccg
                                                                                                                                                                                                                                                                                                                  acetoacetyl-coA synthetase; acsA; ATP/GTP-binding; CDP-diacylglycerol--glycerol-3-phosphate
3-phosphateidyl-transferase; D-alanyl-D-alanine dipeptidase; glycosyl hydrolase; heat shock protein (hsp90-family); mannose-1-phosphate guanyltransferase; mutT; phosphotnansferase component IIA.

Streptomyces coelicolor A3(2)
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyceae; St
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Streptomyces coelicolor AL353861 AL353861.1 GI:7649591
                                                                                                                                                                                    Actinomycetales; Streptomycineae;
1 (bases 1 to 37521)
Redenbach, K., Kiseer, H.M., Denapa
Kinashi, H. and Hopwood, D.A.
                                                                                                                                                 set
ishi, H. and Hopwood, D.A.
ishi, H. and Hopwood,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="SCF41.05, possible 2-hydroxyhepta-2,4-diene-1,7-dioate isomerase, len: 292 aa. Similar to many e.g. Mycobacterium leprae TR:033119 (EMBL; 299263) possible 2-hydroxyhepta-2, 4-diene-1,7-dioate, isomerase (242 aa) fasta scores opt: 491 z-score: 566.1 E(): 3.5e-24 40.6% identity in 212 aa overlap, Streptomyces coelicolor TR:086527 (EMBL; AL031124) hypothetical 28.2 KD protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         isomerase/decarboxylase (405 aa), fasta scores opt: 479 z-score: 549.1 E(): 3.1e-23 42.8% identity in 187 aa overlap. Contains a Pfam match to entry PF01557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SC1C2.27 (261 aa), fasta scores opt: 465 z-score: 479.6 E(): 1.9e-21 40.0% identity in 220 aa overlap and to the C-terminus of Escherichia coli SW:HPCE_ECOLI (EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /protein_id="CAB55708.1"
/db_xref="GI:5881915"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FAA_hydrolase."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                x75028) homoprotocatechuate catabolism bifunctional
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3818. .4696
/gene="SCF41.05"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="putative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   37521 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            10.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 44.6;
Pred. No. 17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cosmid 1A8A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches 144;
                                                                                                                                                                                                                                      Denapaite, D., Eichner, A., Cullum, J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2-hydroxyhepta-2,4-diene-1,7-dioate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB
                                                                                                                                                                                                                                                                                                   Actinobacteridae;
Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 43349;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        25-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sugar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aa),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
JOURNAL
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE
REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE
                                                                                                                                  gene
                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                http://www.nih.go.jp/
http://www.nih.go.jp/
http://www.nih.go.jp/
jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the manufacture of the code of the c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS which show significant similarity to other CDS in the database The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptomyces coelicolor sequencing at The Sanger Centre is funded by the BBSRC and Beowulf Genomics Details of S. coelicolor sequencing at the Sanger Centre are available on the World Wide Web
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. David A. Hopwood, [3] John Innes Centre, Norwich Research Park,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sequenced clone. It may be shorter because we only sequence overlapping sections once, or longer, because we arrange for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gene prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   are also included but some of these may be The length in codons is given for each CDS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (URL; http://www.sanger.ac.uk/Projects/S_coelicolor/)
CDS are numbered using the following system eg SC7B7.01c. SC (S. coelicolor), 7B7 (cosmid name), .01 (first CDS), c (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Colney, Norwich, Norfolk NR4 7UH, UK Notes:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Submitted (25-APR-2000) Streptomyces coelicolor sequencing project,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Cosmid 1A8A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             upstream initiation codon.

IMPORTANT: This sequence MAY NOT be the entire insert of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Usually the highest scoring match found by fasta on is given for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          strand)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bentley,S.D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      small overlap between neighbouring
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The more significant matches with motifs in the PROSITE database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Harris,D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97000351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="SCIABA.Olc, partial CDS, hypothetical protein, >183aa; similar to SW:050603 (YODD_MYCTU) hypothetical protein from Mycobacterium tuberculosis (225 aa) fasta scores; opt: 641, z-score: 633.8, E(): 7.1e-28, 64.7% identity in 150 aa overlap. Note possible alternative
                                                                                                                                  complement(554. complement(712.
                                                                                                                                                                                                                                 GSGTQRLYSFRDVVVLKIVKRFLDTGVSLQNIRTAVQHLRERGFRDLERMTLMSDGAT
VHECTSPEEVHALLQGGQGIFGI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(<1. .549)
/gene="SC1A8A.01c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(1..549)
/gene="SC1A8A.01c"
                                                                                                                                                                                                                                                                                                                            /translation="mRISGDGTVGGGPGHSFGAGGPYPPPGSRLRAGAGHAQHGVAAD
PGPQRPAAVPTSGGATSMASEQIGYRGPTACAAAGITYRQLDYWARTGLVEPSVRPAH
                                                                                                                                                                                                                                                                                                                                                                                                                           /transī_table=11
/product="hypothetical protein"
/protein_id="CAB88877.1"
/db_xref="GI:7649592"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       translational start sites
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="Streptomyces
/strain="A3(2)"
/db_xref="taxon:100226"
                                                                                          /gene="SC1A8A.02c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /clone="cosmid 1A8A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1
to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Parkhill, J., Barrell, B.G. and Rajandream, M.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             37521)
                                                                                                                                       .1185)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 coelicolor A3(2)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                submissions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            downstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           fortuitous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   an initiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cambridge
```

most

len:

```
misc_feature
                                                                                                                                                                                                                                                    /gene="SCIA8A.04c"
/note="Pfam match to entry Pi/10,30, E-value 2.5e-18"
complement(3048. 3902)
/gene="SCIA8A.05c"
complement(3048. 3902)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="SC1A8A.03c, hypothetical protein, len: 246aa; similar to Sw:050605 (YODE MYCTU) hypothetical protein from Mycobacterium tuberculosis (247 aa) fasta scores; opt: 359, z-score: 418.8, E(): 6.8e-16, 42.2% identity 230 aa overlap."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="SC1A8A.02c, conserved hypothetical protein, len: 157aa; similar to many eg. Sw:050604 (YODE_MYCTU) hypothetical protein from Mycobacterium tuberculosis (164 aa) fasta scores; opt: 592, z-score: 709.0, E(): 4.6e-32 60.2% identity in 161 aa overlap."
                                                                                                                                                                                       /note="SC1A8A.05c, hypothetical protein, similar to SW:Q50608 (YODI_MYCTU) hypothe
                                                                                                                                                                                                                                                                                                                                                                                                  GAPSVDPAQSGGIGFGQPSAPGGGFTPDPYASNAPAGQSRQEDPSMSALVCTRCGNRN AENISRCSNCGAPLRPGAVPERASETTSTISISGLEAVDAEVTGQTAMPALSPEAQAA VDALPLGSALLVVRKGGNEGSBRELLDGELTTAGRHPQSDIFLDDVTVSRRHVEFRRSP DGSFTVADVGSLNGTTVNRERIDQVALSNGDEVQIGKYRLVFYASQRGY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EARTKELAGLAVKLHAALVQTALGVRLP*complement(2012...2017) complement(2054...2857)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="SC1A8A.04c"
complement/?or:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LESEGLVEPRRTPAGYRKFGAHDVERLGQVLRMQRDHYLPLKVIREHLDAVERGEAVA
LPRVGRQRDGEAAAPEPAEGPTVARTGRDELLATAGTGEQELKEWESYGLLVPLPDGA
YDAEAVTVASLVVQLGRFGIEPRHLRVMKAAADREAGLVDQVVAPLKRHRNPQTRAHA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="SC1A8A.03c"
/note="SC170"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="SC1A8A.03c"
complement/100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /translation="mnelDVVGVRVEMPSNQPIVLLREVGGDRYLPIWIGPGEATAIA FAQQGMAPARPLTHDLFKDVLEAVGQELSEVRITDLRDGVFYAELVFASGVEVSARPS
/transl_table=11
/product="hypothetical
/protein_id="CAB88881.1
/db_xref="GI:7649596"
                                                                                                                         similar to SW:050608 (YODI_MYCTU) hypothetical protein from Mycobacterium tuberculosis (292 aa) fasta scores; opt: 421, z-score: 440.5. E(): 4.2e-17, 33.6% identity 277 aa overlap. Contains potential coiled-coil region
                                                                                                                                                                                                           /gene="SC1A8A.05c"
/note="SC1A8A.05c"
                                                                                                                                                                                                                                                                                                                                                                               complement(2096.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="hypothetical protein"
/protein_id="CAB88879.1"
/db.xref="G1:7649594"
/translation="MFQTPSGGAGQGAAATDSGLMSIGAVLNALRDEFPDITISKIRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DAIALALRTGTPIYGSDTVLDDAGIAIPDEQEDEVEKFREFLDQISPEDFGTSNQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="conserved hypothetical protein"
/protein_id="CAB88878.1"
/db_xref="GI:7649593"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       translation="MKLFAKLFGKSAREGSGDNATARHRAQPDAEGRRPMYRDQVGGP/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
/product="hypothetical protein"
/protein_id="QAB88880.1"
/db_xref="GI:7649595"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="SC1A8A.02c"
                                                                                    /codon_start=1
                                                                                                         106-140aa."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                 .2290)
                                                                                                                                                                                                                                                                                                                                        PF00498
                                                                                                                                                                                                                                                                                                                                      FHA, FHA domain, score
                                                                                                                                                                                                               len:
                                                                                                                                                                                                               284aa;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4.6e-32
                                                                                                                                                  in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in
                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                LOCUS
                                                                                                                                                                                                                                                        Вþ
                                                                KEYWORDS
                                                                                    VERSION
                                                                                                         ACCESSION
                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RBS
gene
                                                                                                                                                                                                                                                                                                                                        5685
                                                                                                                                                                                                                                                                                                                                                                                                                          5745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   175
                                                                                                                                                                                                                                                                                                                                                                                 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            148;
```

gene

RBS

gene

gene CDS

```
gtcgaccccgacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggcc 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            atgcggctggaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GAGATCGTGGCGTCCTCGCGGGCCGCGTTCGGCGTGCGGTTCGACCCCGTCGGTGAACGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGGATCGCCGAGCAGGTCGCCGCGTACCACGGCACGCAGGTCGAGTGGACGACCACCTCC 5686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgtacggttccttcgtt 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CTCGACCTGATCGCGGCCGAGCGCCGCAGCGGCCGGGTGGCCGCTCCCGGTGACCACCACC 5746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CTGTCGCTCGTCGACGAGAAGGGCCCGCATCATCGAGGACGACCGGGCGCTGCTGGTGATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gagetgttegeggeetteeegteattegeeggaeteeggeeeacettegaeaceeggttg
                                                                                                                                                                                                                                                                                                                            GGCGGCTTCATCGTCCCCGAG 5605
                                                                                                                                                                                                                                                                                                                                                                           ggcattcttactgtgtcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgcacggtgtcgctgccggtaggtgctgacgaggacgacattaaggccacctacgacaag
                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGGACGATCTGACGCGGGTGGGGGGGGGGAGGAAGGCGCGATCTTCGGCGGAGACGGCAAG
                ALO31031.1 G1:3294233
16S TRNA; 23S TRNA; SS TRNA; ATP dependent DNA helicase; DNA
glycosylase; ftsK homolog; pgsA; phosphatidylqlycerophosphate
synthase; rrnE; sensory histidine kinase; transfer-RNA-Thr;
                                                                                                                                                         SC7C7 3
                                                                                                                                   AL031031
two-component regulator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="SCIA8A.06c, possible integral membrane protein, len: 110aa; similar to SW:Q50609 (Y0DJ_MYCTU) hypothetical protein from Mycobacterium tuberculosis (121 aa) fasta scores; opt: 478, z-score: 600.3, E(): 5.2e-26, 67.3% identity in 110 aa overlap. Hydrophobic."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation="mSDDEQPANRLRKELPDEVPPSRSPSADGPAGGLPGAARGERNG VTGRORLLKGLWPPRLTRAQLLVALLLFGLGFGLAVQVASNSOSDSALRGARQEDLVR ILDELDDRTQRLEDEKQGLEKQRDELENSSDAAEARKOTLEKERQLGILAGTVAAQG PGITVTIEDTKGTVEADMLLDAVQELRAAGABAIQVNGVRVVAGTYLADGNSVTVDG NKINAPYRFQVIGKPQDLEPALNIPGGVVQTLEKEQATVTVERSSKIVVDALRAAERP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note-"SCIABA.07c, possible membrane associated protein, len: 110aa; similar to SW:050610 (YDDK_MYCTU) hypothetical protein from Mycobacterium tuberculosis (307 aa) fasta scores; opt: 499, z-score: 537.1, E(): 1.7e-22, 38.3%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(4237. .5142)
/gene="SC1A8A.07c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(3908. .4240)
/gene="SC1A8A.06c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="SC1A8A.06c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement (4237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transī_table*11
/product="putative integral membrane protein"
/protein_id="CAB88882.1"
/db_xref="G1:7649597"
/translation="MIAVLGLVVGVVAGLLVRPEVPAAVEPYLPIAVVAALDAVFGGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(3906. .3909)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RAMLDGIFDDKVFVVSFLSNVVVAALIVFLGDKLGVGAQLSTGVVVVLGIRIFSNAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="SC1A8A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      identity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RRHVFRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                            coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10.2%;
46.1%;
                                                                                                                                                                                   qd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      in 282 aa overlap. Contains possible
                                                                                                                                                                                                                                                                                                                                                                                 375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 44.2;
Pred. No. 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred. No.
                                                                                                                                                                                     DNA
                                                                                                                                                               cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .5142)
                                                                                                                                                               7C7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 37521;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                           06-JUL-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            114
                                                                                                                                                                                                                                                                                                                                                                                                                                      5626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0
```

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE
                                                                                                                        gene
                                                                  rRNA
                                                                                                                                                                                                                        rRNA
                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                          rRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       are also included but some of these may be fortuitous. The length in codons is given for each CDS.

Usually the highest scoring match found by fasta -o is given for CDS which show significant similarity to other CDS in the database. The position of possible ribosome binding site sequences are given where these have been used to deduce the initiation codon. Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sequenced clone. It may be shorter because we only sequence overlapping sections once, or longer, because we arrange for a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              prediction is based on positional base preference in codons using specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (URL; http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are numbered using the following system eg SC7B7.01c. SC (S. coelicolor), 7B7 (cosmid name), .01 (first CDS), c (complementary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (03-JUL-1998) Streptomyces coelicolor sequencing project, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 ISA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. David A. Hopwood, [3] John Innes Centre, Norwich Research Park,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Redenbach, M., Kieser, H.M., Denapaite, D., Eichner, A., Cullum, J., Kinashi, H. and Hopwood, D.A.

A set of ordered cosmids and a detailed genetic and physical map for the 8 Mb Streptomyces coelicolor A3(2) chromosome Mol. Microbiol. 21 (1), 77-96 (1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Actinomycetales; Streptomycineae; 1 (bases 1 to 31636) Redenbach, M., Kieser, H.M., Denapai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         upstream initiation codon.

IMPORTANT: This sequence MAY NOT be the entire insert of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        http://www.nih.go.jp/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The more significant matches with motifs in the PROSITE database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      strand)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Details of S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  by the BBSRC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Colney, Norwich, Norfolk NR4 7UH, UK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Parkhill, J., Barrell, B.G. and Rajandream, M.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Unpublished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Harris, D. and Taylor, K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Streptomycineae; Streptomycetaceae; St
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Streptomyces coelicolor A3(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Streptomyces coelicolor A3(2).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                small overlap between neighbouring
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (bases 1 to 31636)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1 to 31636)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4H8 on the AseI-B genomic restriction fragment
                                                                  4307.
                                                                                                                        /note="23S rRNA
1104. .4223
                                                                                                                                                                                                                        1104.
                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Streptomyces coelicolor A3(2)"
/strain="A3(2)"
/db_xref="taxon:100226"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1. .31636
                                                                                     /gene="rrnE"
                                                                                                                                                                                     /gene="rrnE"
                                                                                                                                                                                                                                           /gene="rrnE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
note="58 rRNA, approximate coordinates"
                                                                                                                                                                                                                                                                                                        note="16S rRNA"
                                                                                                                                                                                                                                                                                                                                       'gene=
                                                                                                                                                                                                                                                                                                                                                                                                 clone="cosmid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           coelicolor sequencing at The Sanger Centre is funded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        coelicolor
                                                                                                                                                                                                                     .4223
                                                                                                                                                                                                                                                                                                                                              rrnE"
                                                                                                                                                                                                                                                                                                                                                                                                    7C7"
                                                                                                                                                                                                                                                                                                        gene,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sequencing at the Sanger Centre are
                                                                                                                                                        gene,
                                                                                                                                                  approximate coordinates'
                                                                                                                                                                                                                                                                                                        partial,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                submissions.
                                                                                                                                                                                                                                                                                                        approximate coordinates"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Streptomyces.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7C7
                                                      gene
                                                                                                                     RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gene
                                                                                                                                                                               RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     trna
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 stem_loop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(5410. .8160)
/gene="SC7C7.02c"
/note="SC7C7.02c"
/note="SC7C7.02c, possible regulatory protein, len: 916
aa; N-terminus is similar to S. coloicolor TR:Q53897
(EMBL:X60316) abaA orfA (192 aa), fasta scores; opt: 248
z-score: 257.6 E(): 4.1e-07, 34.2% identity in 187 aa
overlapC-terminus is similar to several rsbU homologs
e.g.Bacillus licheniformis TR:G05229 (EMBL:AF034567)
putative sigma-b regulator similar to B. subtilis RsbU
phosphatase (335 aa), fasta scores; opt: 232 z-score:
196.5 E(): 0.001, 26.3% identity in 240 aa overlap"
                                                                                                                                                                                                                                                                                                                       GARVWTAPAEMAHKAALRTSMRDLGLSGGPTPQLSTGIGPTLATASAVGGETVVLPLV
ARNRVIGMLTLGKPTDDHFRQEILELAEDLSRRAALALDNARLYSERTAISQSLQRSL
LPPELPVIDGVEVEVLYRAAGEGNEVGGDFYDLFPISDDAYGFAIGDVCGTGPNAAAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                PDDLDGLLQRTVERARDMLDADAAFLLLATDDETELEVRASTGLPSARQRFARVPVEA
GPGRYGSARMPAVHDDLEAVPGAVPLLNSTGMRSVVTVPLKVEGRLTGSLGVAAEAAG
RYSNEEALRLQFAADRIALAVESARLGELERLRRGSLSFLVEASDLLAGTLDRDQTLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="trNA Thr; anticodon GGT"
complement(5410. .8160)
/gene="SC7C7.02c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PTLKNVWFHLHLPERPYGTRAAGPSLPAALLPLADGRVRVAVVQIDRTGAVASWNEDA EDLFGYSADQVTGKPLTDLAAWPHTPGTSTGIAEALQLSRWEGSYGMRGANGRVTPVY ASHLRVRDADGEPSTVCLLVRDHERAVLQTPLRGPAADSPSSEGQSTDPFEVFIGSPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="putative regulatory protein"
/protein_id="AAL9848.1"
/db_xref="G1:3294235"
/db_xref="SpTrEMB1:086807"
/translation="MTTGLIPGEQPPDPGPTGGLPQQRHEPVGHEAVHGERGSRSSVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             hydrophobic region from B. subtilis DEGT_BACST pleiotropic regulatory protein (372 aa), fasta scores; opt: 289 az-score: 450.7 g(): 7.2e-18, 51.7% identity in 89 aa overlap. Also similar to e.g. TR:P72452 (EMBL:Y00459)
                                                                                                                                                                           complement(8171.
                                                                                                                                                                                                                                                              TGLARHALRLLAREGLSGPAVLERLNSAILDEGARSRFLTLLYGEMRPQQDGSAELKV
VCAGHPLPLRLRQDGTVEPAAEPQPLLGVIEDLELYEQTVTLDPGDVLLCVTDGVTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TARAAASFEPVGRSVASARSFVRDTLQGWGHADIVDDAVVLTSELVTNAVVHAGTTAD
VVCLRSDDGVRIEVADHYPEREVPLQGSPANWGSLDREGGRGLQLCAALADRWGVEYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aminotransferase from Streptomyces griseus(378 aa), fasta scores; opt: 250 z-score: 429.3 E(): 1.1e-16, 29.4% identity in 309 aa overlap"
                                                                                                                                                                                                                                           {	t REGARMLGDDGLADVLTTCTGLTAGAVAARIMRAVERFASDAPSDDMAILAMRVPEPH}
                                                                                                                                                                                                                                                                                                                                                                                                                    LMAQMTVPTLATWCAVYTIADQASDPYLSYVLHEDEELIDGIKSLLSKIAPPDPVPTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="mGTAAMLRAAGVGVGDEVVVPAFGNVEVAEAVALAGALPVFADI
DPDTYCLDASLVEAALTPRTAAVVVVHRFGRPADMGSLHRIGERHGLLVLERGESEAP
YDEIARRRQRAAYLDGKLRGVRTPDGGDGHTYQQYVVRVPGNGRPDRDAFARAVRGRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product="hypothetical protein
/protein_id="CAA19847.1"
/db_xref="GI:3294234"
                                                                                  'note="
                                                                                                                                               note="possible"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GLLQPAY"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VECRVPVRTPVHRMPGFRRCVSLPETERAVDETLALPVEAAL1;KRDMQRIVSACNALG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="possible rr
hairpin loop with
                         'gene="SC7C7.03"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /db_xref="SPTREMBL:086806"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /codon_start=:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         note="SC7C7.01, unknown, len: 225 aa; some similarity to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="SC7C7.01"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .5362
                                                                                  possible RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     rrnE
th 20
                                                                                                                                            upstream of SC7C7.02c
                                                                               upstream of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  operon transcriptional terminator; bp stem"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SC7C7.01"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                916
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       248
```

```
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cacccggttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcgcgga 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgagttttctgagctgttcgcggccttcccgtcattcgccggactccggcccaccttcga 104
                                                                            CGACCTGACGCGGACGGTGACGATCGAGGCGCGAGGCCGAGGTCGCGCAGCTCGCCGACAC
                                                                                                                                                                                                                                                                                                                                                                                            GAGCGTGCCCGGCGTCGTGGGCATCTGGAAGGACCTCAACGACAACGTCAACCTGATGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGAGCAGGTCACGCGGGTGGCCCGCGAGGTGGGCACGGAGGGCCATCCTCGGCGGCCAGGC 11129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGAGATCCTCGAACTGGTCACCACCGTCAACACGATGGTGGACCAGCTGTCGTCCTTCGC 11069
ctacgaca
                                                                                                                                                 ttccttcgttcgcacggtgtcgctgccggtaggtgctgacgaggacgacattaaggccac 344
                                                                                                                                                                                                                                      CAAGAACCTCACGGTCCAGGTGCGGAACATCTCCCAGGTGGCCGCGGCCGTCGCCAACGG
                                                                                                                                                                                                                                                                                                       catcaaggccgagcgcaccgagcagaaggacttagacggtcgctcggaattcgcgtacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcttcccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagctgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (1298 aa), fasta scores; opt: 2011 z-score: 1764.6 E(): 0, 38 3% identity in 1281 aa overlap. Also similar to BARA_ECOLI sensor protein barA (918 aa) (with only one copy of the repeat), fasta scores; opt: 378 z-score: 755.8, E(): 0, 28.9% identity in 619 aa overlap. Extreme N-terminus has similarity to the phosphorylated receiver domain of two-component regulators e.g. SW:YEDW_ECOLI (239 aa), blast scores; Expect = 3.1e-12, 32% identity in 115 aa overlap, and also to the downstream regulator SC7C7.04; 37.6% identity in 109 aa overlap. Contains probable coiled-coil from 1285 to 1364 and Pfam matches to entry signal PF00512, Signal C termial domain, score 230.38 and to entry response_reg PF00072, Response regulator receiver domain, score 146*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DEGTGGPLRGEELKVGRTVNNLVDQLSTFTDEVTRVASEVGTEGKLGGQARVGMSSS
WKDLTDSVNTMAYRLTAQVRDIALVTTAVAKGDLSRKTVHVAGEMLELKNTVNTWD
OLSAFSSEVTRVAREVGTEGALGGQAQVPGVAGVKELTDSVNTMAGNLTAQVREISH
VTTAVANGDLSKKVTVEARGEVAQLAETINQMTETLRIFADEVTRVANETGGEGQLGG
QANVPGAAGTWKDLTDSVNTVFRNLTTQVRDLAAVTTAVASGDLSQKVTVUVAGEMLE
LKNTVNTMVDQLSAFGAEVTRVAREVGEGELGGQAQVPGAAGTWKDLTDSVNTAFRN
LTGQVRNIAQVTTAVANGDLSQKVTVDVSGEMLQLKNTVNTMVDQLSSFADQVTRVAR
DVGTEGRLGGQARVDGVSGTWKELTDSVNSMAGNLTSQVRTAVARGDLSQK
DVGTEGRLGGQARVDGVSGTWKELTDSVNSMAGNLTSQVRTAVARGDLSQK
DVGTEGRLGGQARVDGVSGTWKELTDSVNSMAGNLTSQVRTAVARGDLSQK
TDSVNKMAGNLTAQVRNIAQVARAVARGDLSQKTVDARGEILELKNTLMTMVDQLSS
FAQEVTRVAREVGTEGILGGQAEVQGVSGTWKDLTQSVNGMANNLTMQVRNIAEVTTA
VAKGDLSKKITVDAKGEILELVTTVNTMVDQLSSFADQVTTVAVARDLTSGVNGMANNLTMQVRNIAEVTTA
VAKGDLSKKITVDAKGEILELVTTVNTMVDQLSSFADGVTTAVARGDLTSTTTIEARGEVAQLADT
FNTMVRTLRSFADQVTKVAREVGTEGILGGQAQVPGVSGTWKDLTESVNQMASNLTGQ
VRNIAMVTTALAKGDLTKKIDIDARGEILELKTTINTMVDQLSSFAEGVTRVAREVGT
FNTMVRTLRSFADQVTKVAREVGTEGILGGQAQVPGVSGTWKDLTESVNQMASNLTGQ
VRNIAMVTTALAKGDLTKKIDIDARGEILELKTTINTMVDQLSSFAEGVTRVAREVGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="SC7C7.03, probable sensory histidine kinase, len: 1829 aa; N-terminus has 11 92 aa repeats. Highly similar to putative osmosensing histidine kinases from yeasts (with only five repeats) e.g. Neurospora crassa TR:001318 (EMBL:U53189) osmotic-1 locus putative histidine kinase (1298 aa), fasta scores; opt: 2011 z-score: 1764.6 E(): 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="SC7C7.03"
/note="SC7C7.03,
1829 aa; N-termi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RLLAALVSMREGNERRRLTVSGDGVMSETAAVENEVADRNLHLTGELARVRRVVGREG
KLTERLETGACEGSWAAAIDHSNALVDDLVRPVSEVSRVLSAVADGDLSPRMELRTQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="putative sensory histidine kinase"
/protein_id="CAA19849.1"
/db_xref="GI:3294236"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGEISELQDYINKMIANLRDTTIANKEQDWLKGNLARISGLMQGRRDLQDVASLIMSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EGQLGGQARVRDVDGTWRDLTESVNEMAGNLTRQVRAIARVATAVTRGDLNLKIDVDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="MESGAATRATKTRAKGGQSLSNQGKSRGGGARSGSTTVDTAALN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:086808"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 44; DB 7
Pred. No. 24;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 165;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 31636;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                               284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         224
                                                                                                                                                                                                                                      11249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11310 CTTCAACA 11317
```

δÃ B Ω В δõ B Ş ф

105

11010

45

11070

11130 165

225

Ouery Match est Local S latches 143

143;

밁

δÃ

```
Continuation
                                                    FEATURES
                                                                                                                                                                           SOURCE
ORGANISM
                                                                                                                                    REFERENCE
                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                 VERSION
                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                     SAUSIGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPCOMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 10
LMFLCHR12_14
                                                                                                                                                                                                                                ACCESSION
                                                                  JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence split into 
Fragment Name
                                                                                                         TITLE
                                                                                                                       AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                             61861
                                                                                                                                                                                                                                                                                                                                                                                 61801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LMFLCHR12_09
LMFLCHR12_10
LMFLCHR12_11
LMFLCHR12_12
LMFLCHR12_13
LMFLCHR12_14
LMFLCHR12_15
LMFLCHR12_16
LMFLCHR12_16
LMFLCHR12_17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LMFLCHR12_03
LMFLCHR12_04
LMFLCHR12_05
LMFLCHR12_06
LMFLCHR12_07
LMFLCHR12_07
LMFLCHR12_08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LMFLCHR12_20
LMFLCHR12_21
LMFLCHR12_22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LMFLCHR12_18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LMFLCHR12_00
LMFLCHR12_01
                                                                                                                                                                                                                                                                                                                                                       385
                                                                                                                                                                                                                                                                                                                                                                                                           325
                                                                                                                                                                                                                                                                                                                                                                                                                                                     265 cgctcggaattcgcgtacggttccttcgttcgcacggtgtcgctgccggttaggtgctgac 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LMFLCHR12_02
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                 gaagggaagccaaccgaaaagcacattcagatccggtccaccaactga 432
                                                                                                                                                                                                                                                                                                                                                                                 CAGGACACGATCAAGGCCGCTTTCAAGAACGGCGTGCTCACGATCACGATGGAAAAGCGC
                                                                                                                                                                                                                                                                                                                                                                                               GAGGCCAGTACGCCCAANCAGGGGCGCTCGATCCCGATCAACGGCTGA
                                                                           Cloning and characterization of the gene coding factor of Stigmatella aurantiaca Gene 143, 123-127 (1994)
                                                                                                                                                                                                                              SAUSIGA 2748 bp DNA BCT 16-AUG-1994 Stigmatella aurantiaca sigma factor (sigA) gene, complete cds. M94370
                                                                                                                    Skladny, H., Heidelbach, M. and Schairer, H.-U
                                                                                                                                               Bacteria; Proteobacteria; delta subdivision; Myxobacteria; Myxococcales; Cystobacterineae; Cystobacteraceae; Stiqmatella.
                                                                                                                                                                          Stigmatella aurantiaca (strain DW4) DNA. Stigmatella aurantiaca
                                                                                                                                                                                                   sigA gene; sigma factor.
                                                                                                                                                                                                                 M94370.1 GI:152655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (15
                                                                                                                                 (bases 1 to 2748)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23)
           1. .2748
/organism="Stigmatella
/strain="DW4"
                                                  Location/Qualifiers
/db_xref="taxon:41"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23 fragments
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2100001
2200001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1800001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1600001
1700001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1000001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of LMFLCHR12 from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2000001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1500001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1400001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1100001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      400001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            100001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Begin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            600001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 810000
910000
11010000
1110000
11210000
1310000
1410000
1510000
1510000
1710000
1810000
19100000
20100000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2210000
2287483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          610000
710000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    410000
510000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pred. No. 18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 43.8;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        110000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          base 1400001 (AL390114 Leishmania major chr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LMFLCHR12 Accession AL390114
                         aurantiaca"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 110000;
                                                                                                                                                                                                                                                                                                                             61908
                                                                                                         for the major sigma
                                                                                                                                                                                                                                                          16-AUG-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                       61800
                                                                                                                                                                                                                                                                                                                                                                                   61860
```

```
BASE COUNT
ORIGIN
                                                                                                                                                       SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                         RESULT 12
AF257177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QУ
 REFERENCE
                                                                                                 REFERENCE
                                                                                                                                                                                                                                     ACCESSION
                                                                                                                                                                                           KEYWORDS
                                                                                                                                                                                                               VERSION
                                                                                                                                                                                                                                                                       DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local S
Matches 99
                                     TITLE
                                                                             AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                1320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RBS
                                                                                                                                                                                                                                                                                                                                                                                        1380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         terminator
                                                                                                                                                                                                                                                                                                                                                                                                                          244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gaagacgagatgaaagaggggcgctacgaggtacgcgcgggagcttcccgggggtcgacccc 183
                                                                                                                                                                                                                                                                                                                                                                                        GAGCAGATCAAC 1391
                                                                                                                                                                                                                                                                                                                                                                                                                  gagcagaaggac 255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                gacaaggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgcacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGCGACGTCATCAAGGACGCGCCCGAAGAGGCTCAGGCCGAGGGCGCCGAGGAGGCCCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTGGCCGTGGCGACATCCTCGACATCGGCAACAAGCTCAAGACGGGCAAGCTGCGCGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcggccttcccgtcattcgccggactccggcccaccttcgacacccggttgatgcggctg
                                                                                                                               Streptomyces thermocyaneoviolaceus.
Streptomyces thermocyaneoviolaceus
Streptomyces thermocyaneoviolaceus,
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                     AF257177 1750 bp DNA BC Streptomyces thermocyaneoviolaceus xylose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 l Similarity
99; Conserv
               Streptomyces thermocyaneoviolaceus xylA (xylose isomerase) Unpublished
                                                                     1 (bases 1 to 1750)
Kwak, Y.-Y., Heo, G.-Y
                                                                                                                                                                                                                                 complete cds.
AF257177
                                                                                                                                                                                                               AF257177.1 GI:7739711
                                                                                                               Actinomycetales; Streptomycineae;
(bases 1 to 1750)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="sigA"
/gene="sigA"
/standard_name="rho-independent"
/note="putative"
/note="putative"
a60 c 936 g 351 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="sigma factor"
/protein_id="AAA26473.1"
/dr_xref="GI:152656"
/translation="MPTQKPSKGSVKPKKKVDPVIRKKKAPDSVTAKGTKAAAAAEEL
ASAEATEKALEKLKKRKAVTEASADDIDPEEAAEEAAAAVEVDPDAVEDEVEEEAIAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene='
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RKEVKDLLAAGREKGFLTYDEVNDALPADIVSSDQIDDVMSMFGDNDIEIVDAQKAAQ
SNEIKPTVAVEEESKQDADADDDDEDDEPGGKSNDPVRLYLRKMGSVSLLTREGEVEI
AKRIEDGEKEVLRAMLACRVAVADILDIGNKLKTGKLRVRDVIKDAPEEAQAEGAEEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KELRPQLKESRDNPNTAKKLQKQLNFTPEQLEALDRDVRTAVRKIKRVEEEEANLPVDA
LRRNYDAIRLGERRAERAKSELVEANLRLVVSIAKKYTNRGLQFLDLIQEGNIGLMKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PEEGVEGEQPQQLAQSELNKIEQINKQIERFRKFAKDCEVLEEELSGKKKLTDVKKKE
VKQEVKDLRTKMMEVLEEMRLNKKQVDRIVLNLKQLIERVDKAEEELRDLERRNGVSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IEAKALRKLRHPSRSKRLRSFVES"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <u>ADAVINMNLAARTRKVLATLTPREEKVLRMRFGIGEKSDHTLEEVGQDFEVTRERIRQ</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VDKFEYKRGYKFSTYATWWIRQAITRAIADQARTIRIPVHMIETINKLIRTSRYLVQE
IGREPTPEEIAEKMELPLDKVRKVLKIAKEPISLETPIGEEEDSHLGDFIEDKSLVSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="putative"
475. .2657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="sigA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /standard_name="SigA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="sigA"
                                                                           Heo, G.-Y., Shin, J.-H., Jang, H.-S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "sigA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 43.2; DI
Pred. No. 74;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                   Streptomycetaceae; Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 93;
                                                                                                                                                                                                                                                                     isomerase (xylA)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 2748;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                           Joo, G. -J. and
                                                                                                                                                                                                                                                                                           09-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                     gene,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                1379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                         RESULT 1
SHU27483
                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORIGIN
                                                    FEATURES
                                                                                                                                                       REFERENCE
                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                           LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                        VERSION
                                                                                                                                                                                                                                                                                                                                            ACCESSION
                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                          KEYWORDS
                                                                                                                     AUTHORS
TITLE
                                                                                                                                                                                      AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 77; Conserv
                                                                                                                                                                        JOURNAL
                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                              1516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1396 GAGGTCCAGGAGGCCCTGCGTGCTGCCCGGCTCGACCAGCTCGCCGAGCCCACCGCGGCC 1455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            271
                                                                                                                                                                                                                                                                                                                                                                                                             13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GACGGCCTGCAGGCCCTGCTGGCCGACCGCCACCGCGTACGAGGACTTCGACGTGGACGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCCGCCGCGCGG 1529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gaattcgcgtacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gatggtcagctgaccatcaaggccgagcgcaccgagcagaaggacttagacggtcgctcg 270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Submitted (17-APR-2000) Department of Agricultural Chemistry, college of Agriculture, Kyungpook National University, #1370 Sankyuk-dong, Buk-ku, Taegu 702 - 701, Korea Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                          SHU27483 399 bp
Suid herpesvirus 1 g
U27483
                                                                  Submitted (23-MAY-1995) Tin-yun Medicine, National Chung-Hsing UTaichung 40227, Taiwan
                                                                                                                                                                                     1 (bases 1 to 399)
Ho,T., Hsiang,C. and Chang,T.
Characteristics of early transcripts
                                                                                                                                                                                                                                                                                                                          U27483.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rhee, I.-K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kwak,Y.-Y., Heo,G.-Y., Shin,J.-H., Jang,H.-S., Joo,G.-J. and
                                                                                                                                                                     Unpublished
                                                                                                                                                                                                                                                                         Pseudorabies virus
                                                                                                                     Direct Submission
                                                                                                                                         ĕ,
                                                                                                                                                                                                                                      Viruses; dsDNA viruses, no RNA stav
Alphaherpesvirinae; Varicellovirus
                                                                                                                                                                                                                                                                                         Pseudorabies virus.
                                                                                                                                                       (bases 1 to 399)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AFTANDRDVRRYALRKTIRNIDLAVELGAKVYVAWGGREGAESGAAKDVRAALDRMKE
AFDLLGSVYTSOGYDLRFAIEFKPNEFRGDILLFTIGHALAFIERLERFELYGVNPEV
GHEQMAGLIPPHGIAQALHAGAKLFHIDLINGGSGIKVDDDLAFGAGDLRAAFHUVDLLE
SAGWEGPRHFDFKPPRTEDIDGVWASAAGCMRNYLILKERAAAFRADPEVQEALRAAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="xylA"
424. .1590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDQLAEPTAADGLQALLADRTAYEDFDVDAAAARGMAFERLDQLAMDHLLGARG" 661 c 588 g 254 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MNYQPTPEDRETEGLWTVGWQGRDPFGDATRPALDPVEAVQRLA
ELGAYGVTFHDDDLIPFGSSDAEREAHVKRFRQALDATGMTVPMATTNI.FTHFVFKDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="xylose isomerase"
/protein_id="AAF68977.1"
/db_xref="GI:7739712"
/organism="Pseudorabies virus"
/strain="TNL"
                                    1. .399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           424.
                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="xylA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="taxon:106355"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         organism="Streptomyces thermocyaneoviolaceus"
/strain="KCCM 40049"
                                                                                                                                                                                                                                                                                                                          GI:1304427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .1590
                                                                                                                                                                                                                                                                                                                                                          glycoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 42.8; DB Pred. No. 1e+02;
                                                                                                                                                                                                                                                                                                                                                                           mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                      RNA stage;
                                                                                    University,
                                                                                                       Ho,
                                                                                                                                                                                                                                                                                                                                                        gII mRNA, partial
                                                                                    Department
ersity, 250
                                                                                                                                                                                        of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     57;
                                                                                                                                                                                                                                                       Herpesviridae,
                                                                                                                                                                                        pseudorabies virus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1750;
                                                                                    Kuo-Kwang Road
                                                                                                       of Veterinary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0,
```

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    οy
                                                                                                                                                                                                                                                                                                                                                                          KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                     ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Дb
                                                                                                                                                            FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
                                                                                                                                                                                                                                                                                                     AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                ocus
                                                                                                                                                                                                    TITLE
JOURNAL
                                                                                                                                                                                                                                                                                         TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                            JOURNAL
                                                                                                                                                                                                                                                                                                                                                             ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    est Local Sin
atches 107;
                                                                                    gene
                                                          CDS
                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              polyA_signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tgaccatcaaggccgagcgcaccgagcagaaggac 255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tcgacacccggttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcg 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          teccegagttttetgagetgttegeggeetteeegteattegeeggaeteeggeeeacet 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TGTCCATCGTGTCGGCCCTCGAGCAGCAGCAGCAC 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TCGAAGAAGCCGACGTGGACGAGGCCAAGCTGGACCAGGCCCGGGACATGATCCGGTACA 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cggagcttcccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagc 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCCGCAACCCCATGAAGGCCCTGTACCCCGTCACGACGAAGGCGCTCAAGGAGGACGGCG 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TGCTGGTGCTGGCCGGCCTGGTCGCGGCCTTCCTGGCCTACCGGCACATCTCGCGCCTGC 85
                                                                                                                                                                   Hong, W., Chen, H., Xiao, S., He, Q. and Fang, L. Direct Submission
Submitted (17-APR-2000) College of Animal Science & Veterinary Medicine, Huazhong Agricultural University, Lion Montain Street Wuhan, Hubei 430070, P.R.China
                                                                                                                                                                                                                                                                                                      Hong,
                                                                                                                                                                                                                                                                          strain
                                                                                                                                                                                                                                                                                                                                                                                                                   Pseudorabies virus
AF257079
                                                                                                                                                                                                                                                         Unpublished
                                                                                                                                                                                                                                                                                         Clone and sequence analysis
                                                                                                                                                                                                                                                                                                                                                             Pseudorabies virus.
Pseudorabies virus
                                                                                                                                                                                                                                                                                                                                                                                                       AF257079.1 GI:7739722
                                                                                                                                                                                                                                                                                                                                 Alphaherpesvirinae; Varicellovirus
                                                                                                                                                                                                                                                                                                                                              Viruses; dsDNA viruses, no RNA stage; Herpesviridae;
                                                                                                                                                                                                                                             (bases 1 to 2724)
                                                                                                                                                                                                                                                                                                     (bases 1 to 2724)
g,W., Chen,H., Xi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="glycoprotein gII"
/protein_id="AAB26946.1"
/protein_id="AAB26946.1"
/db_xref="GI:1335775"
/ta_nslation="ppgaLAIGLLVLAGLVAAFLAYRHISRLRRNPMKALYPVTTKAL
KEDGVEEGDVDEAKLDQARDMIRYMSIVSALEQQEHRRARRTAGPRSWPAGSGRWLRA
AGTTSASRARTPTPCCSPLPRETIKMRLFGNT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /evidence⇒experimental
399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /db_xref="taxon:10345"
<1. .>399
/product="glycoprotein
/protein_id="AAF68982...
                                         /gene≖"gB"
                                                                     /gene="gB"
                                                                                             /strain="Ea"
/db_xref="taxon:10345"
                                                                                                                              organism="Pseudorabies"
                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /evidence=experimental
141 c 135 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
/evidence=experimental
                             codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9.8%;
49.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                 2724 bp DNA
virus glycoprotein B GII (gB)
                                                                                                                                                                                                                                                                                      Xiao,S., He,Q. and Fang,L. e analysis of gB gene of Pseudorabies Virus Ea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 42.2; DB 72; Pred. No. 2.1e+02;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches 108;
     n B GII"
.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         52
                                                                                                                                                                                                                                                                                                                                                                                                                                 gene,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                 partial
                                                                                                                                                                                                                                                                                                                                                                                                                                             09-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                        Street,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                                                                                                                                             VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORIGIN
                                                                                    FEATURES
                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                          REFERENCE
                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BASE COUNT
                                                                                                                                           AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                              JOURNAL
                                                                                                                                                                                        MEDLINE
                                                                                                                                                                                                    JOURNAL
                                                                                                                                                                                                                                TITLE
                                                                                                                                                                                                                                                            AUTHORS
                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          107;
                                                                                                                                                                           98361886
2 (bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ۵
```

```
/db_xref="GI:7739723"
//tanslation="MPAGGLMRGPRGHRPGHHGGAGLGRLWPAPHHAAAARGAVALA
//translation="MPAGGLMRGPRGHRPGHHGGAGLGRLWPAPHHAAAARGAVALA
LLLLALAAPPTCGAAAVTRAASASPAPCTGAPPDGFSTEESLEELDGAVSPGPSDAPD
GEYGDLDARTAVRAAATERDRFYVCPPPSGSTVVRLEPEQACPEYSQGRNFTEGIAVL
FKENLAPHKEKAHIYYKNVIVTVWSGSTYAAITMRFTDRVPVPVQEITDVIDRRGKC
VSKAEYVRNNHKVTAAFDRDENPVEVDLRPSRLNALGTRGHHTTNDTYTKIGAAGFYHT
GTSVNCIVEEVBARSVEYPYDSFALSTGDIVYMSPFYGLLEGAHGSHIGYAPGRFQQVE
HYYPIDLDSRLRASESVTRNFLRTPHFTVAWWAPKTRRVCSLAKWREAEEMIRDETR
GGSFRFTSRALGASFVSDYTQLDLQRVHLGDCVLREASEAIDAIYRRYNNTHVLAGD
GGSFRFTSRALGASFVSDYTQLDLQRVHLGDCVLREASEAIDAIYRRYNNTHVUDRT
GGSFRFTSRALGASFVSDYTQLDLQRVHLGDCVLREASEAIDAIYRRYNNTHVVLAG
RPEVYLARGGFVVAFRELISNELAQLKARELEERLGLAGVVGASPAAARRARRSPGPA
GTPEPPAVNGTGHLRITTGSAEFARLGFTYDHIQAHVNDMLSRIAAWCELHNKDRTL
WGEMSRLNPSAVATAALGQRVSARMLGDVMAISRCVEVRGGVYVONSMRVPGERGTCY
SRPLVTFEHNGTGVIEGGGGVOXFRUSAY
RWVEVETISTRVTLNLTLLEDREFLPLEVYTREELADTGLLVSEIQRRWGPHTLKF
YDIDRVKUDHNVVLLRGIANFFQGLGDVGAAVGKVULGATGAVISAVGGMVSFLSNP
FGALAIGLLVLAGLVAAFLAKRISGPALLASRVGVMATRRRHYQRL"
409 a 1020 c 921 g 374 t
```

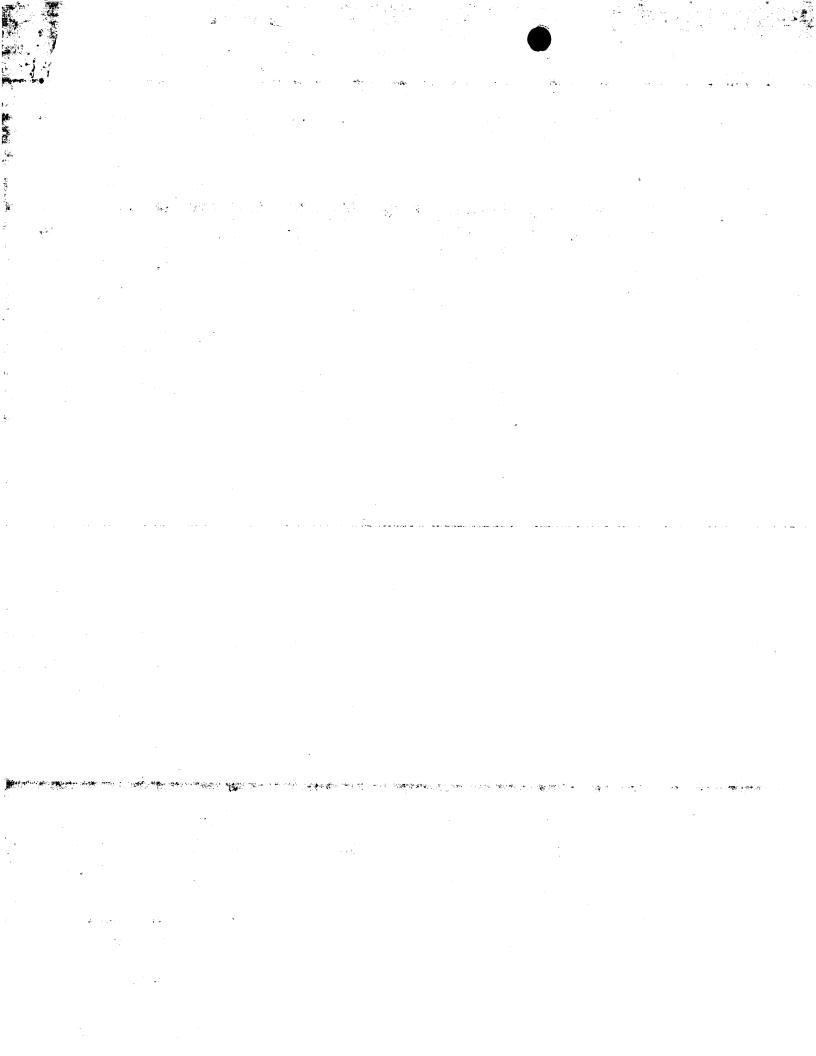
```
41 tccccgagttttctgagctgttcgcgggccttcccggtcattcgccggactccggccacct 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tcgacacccggttgatgcggctggaagacgagatgaaagaggggcgctacgaggtacgcg 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TGCTGGTGCTGGCCGGCCTGGTCGCGGCCTTCCTGGCCTACCGGCACATCTCGCGCCCTGC 2482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TGTCCATCGTGTCGGCCCTCGAGCAGCAGGAGCAC 2637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TCGAAGAGGACGACGTGGACGAGGCCAAGCTGGACCAGGCCCGGGACATGATCCGGTACA 2602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cggagcttcccggggtcgaccccgacaaggacgtccacattatggtccgcgatggtcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCGCAACCCCATGAAGGCCCTGTACCCCGTCACGACGAGGCGCTCAAGGAGGACGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgaccatcaaggccgagcgcaccgagcagaaggac
                                                                                                                                                Submitted (02-DEC-1997) F. Malpartida, Centro Nacional de
                                                                                                                                                                        Direct Submission
                                                                                                                                                                                               Malpartida, F
                                                                                                                                                                                                                                                        induces multidrug
                                                                                                                                                                                                                                                                                                                         Malpartida,F
                                                                                                                                                                                                                                                                                                                                           Bactèria; Firmicutes; Actinobacteria; Actinobacteridae; Actinomycetales; Streptomycineae; Streptomycetaceae; St 1 (bases 1 to 3354)
Fernandez-Moreno,M.A., Carbo,L., Cuesta,T., Vallin,C. a
                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomyces rochei
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Y15759.1 GI:3451322
ABC transporter; ATPase.
Streptomyces rochei.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Streptomyces
Y15759
                                                                                                                            Biotecnologia, Campus de la Universidad Autonoma,
                                                                                                                                                                                                                                                                                                     A silent ABC transporter isolated
                                                                                                                                                                                                                (bases 1 to 3354)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                          Madrid, SPAIN
                    /organism="Streptomyces
/strain="F20"
/db_xref="taxon:1928"
                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          rochei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   49.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3354 bp
                                                                                                                                                                                                                                                        resistance
(16), 4017-4023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        silent ABC transporter genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 42.2; DB 71
Pred. No. 1.1e+02;
0; Mismatches 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA
                                                                                                                                                                                                                                                                                                     from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 108;
                                                                                                                                                                                                                                                                                                     Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 272/;
                                                                                                                                28049-Canto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              21-AUG-1998
                                                                                                                                                                                                                                                                                                     rochei F20
                                                                                                                                                                                                                                                                                                                                                                                         Streptomyces.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0
```

```
BASE COUNT
ORIGIN
                                                                                                                                          Query Match
Best Local S
Matches 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
1810 CGTGCCGGAGCAGCTCTTCGACGTGACGGCGTTCCCCGGTCATGATGGTGCTGATGTACAC 1869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                        9
                                        ccttcccgttcagcgccacccgcggtccctcttccccgagtttttctgagctgttcgcggc 68
                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                          486
                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="ORFB"
complement(2580.
/gene="ORFB"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                          /gene="ORF2"
1649. .2503
/gene="ORF2"
1649. .2503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
/transl_table=11
/protein_id="CAA75762.1"
/protein_id="CAA75762.1"
/db_xref="GI:3451325"
/db_xref="GI:3451325"
/db_xref="SPTREMBL:086917"
/db_xref="SPTREMBL:086917"
/db_xref="SPTREMBL:086917"
/db_xref="SPTREMBL:086917"
/translation="MSTVATETEDHSFTAPRAEDLAALLVAGDRPLRPSALSASLTF
/TRANSLATION="MSTVATETEDHSFTAPRAEDLAALLVAGDRPLRPSALSASLTF
GWRAMLKIKHYPEQLFDVTAFPVMWYLMYTYLFGGALAGSVDAY1QFLLPGILVMSVV
MITMYTGVAINTDIDKGVFDRFRTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGVVV
MITMYTGVAINTDIDKGVFDRFRTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGVVV
MITMYTGVAINTDIDKGVFDRFRTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGVVV
MITMYTGVAINTDIDKGVFDRFRTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGVVV
MITMYTGVAINTDIDKGVFDRFRTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGVVV
MITMYTGVAINTDIDKGVFDRFRTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGVVV
MITMYTGVAINTDIDKGVFDRFTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGGVV
MITMYTGVAINTDIDKGVFDRFTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGGVV
MITMYTGVAINTDIDKGVFDRFTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGGVV
MITMYTGVAINTDIDKGVFDRFTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGGVV
MITMYTGVAINTDIDKGVFDRFTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGGVV
MITMYTGVAINTDIDKGVFDRFTLPLWRPAPMVGYLLGDVVRYFIASVVMLTVGGVSMMVIFPLTFLSN
VFVDRFTMPGGLAGAFVLVFGAV
MTMYTGVAINTDIDKGVFDRFTHLATAVRELLMAGNWPAADIAWSLGWSAAFVLVFGAV
MYTMYTGVAINTDIDKGVFTHLATAVRELLMAGNWPAADIAWSLGWSAAFVLVFGAV
MYTMYTTTINTTURBURGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAGUNGTHAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /protein_id="CAA75761.1"
/db_xref="GI:3451324"
/db_xref="GI:3451324"
/db_xref="SFTREMBL:086916"
/translation="MSTELALETTGLVKVFGENRAVDGVDLRVPAGTVYGLLGPNGAG
/translation="MSTELALETTGLVKVFGENRAVDGVDLRVPAGTVYGLLGPNGAG
KTTTVKVLATLLRPDGGEARVFGRDVLADADAVRGRVSLTGQYASVDEDLTGTENLLL
LARLLGHSKPAARERAAQLLDAFGLSEAAGROYKSYSGGMRRRIDIAASILNTPDLLF
LDEPTTGLDPRSRNOVWDIVRAVVAGGTTVLLTTQYLLDEADQLASRIAVIDHGRVIAF
LDEPTTGLDPRSRNOVWDIVRAVVAGGTTVLLTTQYLLDEADQLASRIAVIDHGRVIAF
GTKGELKASVGSGAVHLRLREAEGRPEAERILALALNATVQLDADPVALTARVWGHGT
EGGAAEGAARALSELARAGITVDNFALGQPSLDEVFLALTDKKALNGGDADMNGANGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      561. .1652
/gene="ORF1"
/function="traffic ATPase"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        548.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(2580.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="CAA75763.1"
/db_xref="GI:3451326"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TMRLYNRK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1649. .2503
/gene="ORF2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="ORF2"
1633. .1641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NGANGASGANGMNSANGMNGTAEQKETAV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          join(548.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TVTVLSLAIAAATFIVTFYYYYHED"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="SSAMATHAAVPVHRHGALGWVVPLTIGALYGLYTSFMTREDGASAGAQFAVGIVSAAVMAGLCYAMGRFQHAMPREVRAAAYAVLMGCAVGYLYSLSGRSIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /transl_table=11
/protein_id="CAA75760.1"
/db_xref="GI:3451323"
/db_xref="SPTREMBL:086915"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="ORF1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="ORF1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="ORFA"
/codon_start=2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   function="transmemebrane protein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     codon_start=
                                                                                                                                                                           9.78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .554,561. .1652)
                                                                                                                                                                                                                                                                                                                                                   1158 g
                                                                                                                                          0;
                                                                                                                                                                           Score 42; DB 73;
Pred. No. 1.1e+02;
                                                                                                                                          Mismatches 195;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .2789)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .2816)
                                                                                                                                                                                                            Length 3354;
                                                                                                                                          Indels
                                                                                                                                      0;
                                                                                                                                   Gaps
                                                                                                                                      0;
```

밁 Ş

```
Qy
                                                                                                                                                                                                                                                 δõ
                                 Qγ
                                                                        DЪ
                                                                                                                                            Вþ
                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                         οy
   2110
                                                                                                                                                                                                                   1930
                                                                        2050
                                                                                                                                            1990
                                                                                                                                                                                                                                                                                      1870 GTACCTCTTCGGAGGGGCGCTGGCCGGCTCGGTCGACGCGTACATCCAGTTCCTGCTGCC 1929
                                                                                                         249
                                                                                                                                                                                                                                                    129
                                                                                                                                                                                189
                                                                                                                                                                                                                                                                                                                           69
                      gccggtaggtgctgacgaggacgacattaaggccacctacgacaagggcattct
                                                                                                                                                             ggacgtccacattatggtccgcgatggtcagctgaccatcaaggccgagcgcaccgagca 248
                                                                                                                                                                                                                                                                                                          cttcccgtcattcgccggactccggcccaccttcgacacccggttgatgccggctggaaga 128
GACGGTCGTCGTCATCGGCTACCGCCCGGGCGGCGGCGCGACCGGGATCCT
                                                                    GATGGTCGGCTATCTCCTCGGCGACGTCGTCCGCTACTTCATCGCCTCCGTGGTGATGCT
                                                                                                    CGACATCGACAAGGGAGTCTTCGACCGCTTCCGCACGCTGCCGATCTGGCGGCCCGCGCC
                                                                                                                                                                                                               CGGCATCCTCGTGATGAGCGTCGTGATGATCACGATGTACACGGGCGTCGCGATCAACAC 1989
                                                                                                                                                                                                                                             cgagatgaaagaggggcgctacgaggtacgcgggagcttcccggggtcgaccccgacaa 188
2163
                                 362
                                                                    2109
                                                                                                                                           2049
```

Search completed: January 12, 2001, 20:08:02 Job time: 26656 sec



```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Run
                                                                                                                                                                                                                                                                                                                                                                                                 Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OM protein - protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on:
                                                                                                                                                                                                                             Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
154.5
149
148.5
145.5
144.5
144.5
140.5
140.5
137.5
137.5
138.5
135.5
135.5
                                                                                                                                                                165.
                                                                                                                                                                                   Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                    seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                    length:
                                                                                                                                                                                                                                                                   6:
7:
9:
10:
11:
12:
13:
                                                                                                                                                                                   Match
                                                                                                                                                                                           Query
374700 seqs, 117207915 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-461-774-8
731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 5, 2001, 14:30:43;
                                                                                                                                                                                                                                                                                                                                                                                                SPTREMBL_15:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTLPVQRHPRSLFPEFSEL...
                                                                                                                                                                                                                                                                                                                sp_phage:*
                                                                                                                                                                                                                                                                                                                                                                                        sp_archea:*
                                                                                                                                                                                                                                                                                                                          sp_organelle:*
                                                                                                                                                                                                                                                                                                                                 sp_mhc:*
                                                                                                                                                                                                                                                                                                                                           sp_mammal:*
                                                                                                                                                                                                                                                                                                                                                    sp_invertebrate:*
                                                                                                                                                                                                                                                                                                                                                             sp_human:*
                                                                                                                                                                                                                                                                                                                                                                              sp_bacteria:*
                                                                                                                                                                                                                                                                  sp_unclassified: *
                                                                                                                                                                                                                                                                            sp_vertebrate:*
                                                                                                                                                                                                                                                                                  sp_virus:*
                                                                                                                                                                                                                                                                                             sp_rodent:*
                                                                                                                                                                                                                                                                                                     sp_plant:*
                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                      2000000000
DВ
                                                      10
10
2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gapext 0.5
10
2
10
                                      10
2
                                                                                          10
                                                                                        P94898
0 Q96458
P70919
       052192
052193
09x9N3
                                   082825
                                                    Q40056
Q9SE11
Q9ZFD1
Q69243
                                                                                                                  053673
Q9XDG8
014368
P72977
Q9K4W0
028308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sw model
                                                                                                                                                                                                             SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Search time 115.27 Seconds (without alignments)
145.404 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 374700
                                                                                                                                     O53673 mycobacteri
Q9xdg8 mycobacteri
O14368 schizosacch
P72977 synechocyst
      Q40866 pennisetum
052192 streptococc
Q9x9n3 streptococc
                                         069243 bradyrhizob
Q40867 pennisetum
                                                                                                                           P72977 synechocyst
Q9k4w0 stigmatella
                                   082825 synechococc
                                                                Q9zfd1
                                                                                        P70919 bradyrhizob
                                                                                                 P94898 oenococcus
Q96458 hordeum vul
                                                                                                                                                                                Description
                                                            Q40056 hordeum vul
Q9sell funaria hyg
Q9zfdl thermotoga
                                                                                                                   archaeoglob
```

45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28	27	26	25	24	23	22	21	20
126.5	127	127	127	127	127.5	127.5	127.5	127.5	128	129	129	130	131	131	131.5	131.5	131.5	131.5	133	133	133	133.5	133.5	134.5	135
17.3	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.5	17.6	17.6	17.8	17.9	17.9	18.0	18.0	18.0			18.2	18.2	18.3	18.3	18.4	18.5
155	238	232	160	157	154	154	154	154	160	156	152	229	210	149	160	150	142	142	182	151	147	153	150	142	160
10	10	10	10	10	10	10	10	2	10	10	10	رب ن	10	10	10	10	Ν	N	2	10	2	10	Ν	N	2
Q41028	Q9SE12	Q9SSQ8	P93440	022531	Q9ZP84	Q9ZS24	Q40698	Q9RNW3	Q40632	Q39930	Q43701	Q27354	Q40978	P93437	Q40057	Q40865	Q9RNV9	Q9RNW7	Q9RVB5	Q41560	Q9WYK7	Q92SY1	052190	Q9X9C3	Q9PBB0
	Q9se12 funaria hyq		P93440 oryza sativ	brassic	Q9zp84 quercus sub	Q9zs24 castanea sa	Q40698 oryza sativ		Q40632 oryza sativ	helianthu	Q43701 zea mays (m	Q27354 toxoplasma	Q40978 papaver som	P93437 oryza sativ		Q40865 pennisetum		Q9rnw7 streptococc	Q9rvb5 deinococcus	0	Q9wyk7 thermot a	Q9zsyl funaria hyg	O52190 streptococc	Q9x9c3 streptococc	Q9pbb0 xylella fas

ALIGNMENTS

RESULT 053673 EMBL; AL021929; CAA17343.1; -. TUBERCULIST; RV0251C; -. INTERPO, IPRO2068; -. PFAM; PF00011; HSP20; 1. PFAM; PF0011; HSP20; 1. PROSITE; PS01031; HSP20; 1. Heat shock. SEQUENCE 159 AA; 17786 MW; 6 MEDLINE-98295987; PubMed-9634230; Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harri. Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Krogh A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Sqares R., Sulston Taylor K., Whitehead S., Barrell B.G.; "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence."; Nature 393:537-544(1998). 053673 053673; 01-JUN-1998 (TYEMBLIEL 06, Created) 01-JUN-1998 (TYEMBLIEL 06, Last sequence update) 01-JUN-2000 (TYEMBLIEL 14, Last annotation update) PUTATIVE HSP20 HEAT SHOCK PROTEIN. 01-JUN-1998 (TrEMBLrel. 01-JUN-1998 (TrEMBLrel. STRAIN-H37RV; SEQUENCE FROM N.A. NCBI_TaxID=1773; Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Mycobacterium tuberculosis RV0251C OR MTV034.17C Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium. PRELIMINARY; PRT; 6EB7DAFDE2C083CF CRC64; 159 AA Harris D.,

Ωy

52 VRAELPGVDPDKDVHIMVRDGQ----LTIKAERTEQK-----DLDGRS--EFAYGSFVRT 100

Query Match Best Local Similarity

22.6%;

Matches

Conservative

13;

Score 165.5; Pred. No. 9.7e 13; Mismatches

; DB 2; .7e-08;

Length 159; Indels

33;

11;

Gaps

```
ACC OCC OCC REPARED TO THE REPARED T
                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
014368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN-MC(2)155;
Caceres N.E., Feng Z
Barletta R.G.;
"Identifi
                                                                                                                                                                                                                                                                                                                               O14368;
O1-JAN-1998 (Tremblrel. C
O1-JAN-1998 (Tremblrel. C
O1-OCT-2000 (Tremblrel. 1
HEAT SHOCK PROTEIN 16.
                                                                                                        Lenaers G.
Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-NOV-1999
01-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO; IPRO02068; -.
EFAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
PROSITE: PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q9xDG8
STRAIN=972H-;
Lyne M., Wood V.,
Churcher C.M.;
                                                                                                                                                                                                                                      Schizosaccharomyces pombe (Fission yeast).
Eukaryota; Fungi; Ascomycota; Schizosaccharomyces
Schizosaccharomycetaceae; Schizosaccharomyces
                                                                 SEQUENCE FROM N.A.
                                                                                                                                                   STRAIN=972 H-
                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                    NCBI_TaxID=4896;
                                                                                                                                                                                                                                                                                                                                                                                                                                           014368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium smegmatis.";
Submitted (JUN-1998) to the
EMBL; AF072875; AAD39038.1;
HSSP; Q57733; 15HS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=1772;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacterium smegmatis.

Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-NOV-1999 (TrEMBLrel.
01-NOV-1999 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
PUTATIVE HSP20.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Identification of a HSP20 heat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        111 TGDAVTASYDAGVLKVRVAGAYAGEQPQRIAIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             116 FRLPAHVTSEAIAASYDAGVLTVRVAGAYKAPAETQAQ 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VRAELPGVDPDKDVHIMVRDGQLTIKAERTEQK--DLDGR--SEFAYGSFVRTVSLPVGA 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DEDDIKATYDKGILTVSVAVSEGKPTEKHIQIRS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VSVELPGVDVGKDVNVEVDRGRLVIHGERRDERSEESDGRTYSEVRYGSFRREFKLPAHV 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VSLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              40;
                                                                                                          (OCT-1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                              PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                      Rajandream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          z.,
                                                                                                                                 Ξ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    21.6%;
                                                                                                            ţ
                                                                                                            Dumont X., Picard A., on the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Li L.-L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12,
12,
15,
                                                                                                                                                                                                                                                                                                                                                   05,
15,
                                                                                                                                                                                                                                                           (Fission yeast).

Ota; Schizosaccharomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
Last seq
                                                                                                                                                                                                                                                                                                                                                   Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Last sequence up
Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 158; DB 2;
Pred. No. 4.2e-07;
                        z
                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        978DC47F74BE30E9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Kapur
                        Barrell
                                                                                                                                                                                                                                                                                                                                                                                                                                              143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ۲,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 141
                                                                                                                                                                                                                                                                                                                                                                                                                                           ĄΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ΑĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     update)
                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Cirillo
                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update)
                      .
G.,
                                                                                                            Caput D.;
J databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             homolog from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 145;
                      Brown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2
```

```
RESULT
P72977
ID P7
AC P7
DT 011
DT 011
DT 011
DT 011
DT 011
DT 01
RN | [1
RN | [1
RN | Ka
RA | Ta
RA | Ta
RT | Sy
RT 
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        엉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9//
P72977 PKLLI...
P72977;
P72977;
01-FEB-1997 (TrEMBLrel. 02
f 01-FEB-1997 (TrEMBLrel. 02
f 01-JUN-2000 (TrEMBLrel. 1/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Danjoh I., Fujiyama A.;
"Ras-mediated signaling pathw
molecular weight heat shock p
Submitted (MAR-1998) to the E
EMBL; AJ003817; CAA06031.1; -
EMBL; AB012619; BA31521.1; -
EMBL; AB012619; BA31521.1; -
HSSP; Q57733; 1SHS.
                                                                                                                                                                                                                                                                                                                                                                                                           Kaneko T., Sato S., Kotani H., Tanaka A., Asamizu E., Nakamura Miyajima N., Hirosawa M., Sugiura M., Sasamoto S., Kimura T., Hosouchi T., Matsuno A., Muraki A., Nakazaki N., Naruo K., Okum Shimpo S., Takeuchi C., Wada T., Watanabe A., Yamada M., Yasuda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Synechocystis sp. (strain PCC 6803). Bacteria; Cyanobacteria; Chroococcales;
                                                                                                                                                                                                                                                                                                                    Synechocystis sp. strain PCC6 entire genome and assignment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A. MEDLINE=97061201;
                                                                                                                                                                                                                      INTERPRO; IPR002068; -.
PFAM; PF00011; HSP20; 1.
                                                                                                                                                                                                                                                                       EMBL;
                                                                                                                                                                                                                                                                                              DNA Res.
                                                                                                                                                                                                                                                                                                                  "Sequence analysis of the genome of the unicellular cyanobacterium Synechocystis sp. strain PCC6803. II. Sequence determination of the entire genome and assignment of potential protein-coding regions."
                                                                                                                                                                                                                                                                                                                                                                                               Tabata S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=1148;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INTERPRO; IPR002068; -. PFAM; PF00011; HSP20; 1. PROSITE; PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Submitted (MAY-1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            118
    47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |:|||:: | |:| |:| |:| NGLLTVTLPKVEKSQTKKQIAIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DVHIMVRDGQLTIKAE-----RTEQKDLDGR-SEFAYGSFVRTVSLPVGADEDDIKATYD 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  shock
    EGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAER--TEQKDLDG--RSEFAYGSFVRTVS 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KGILTVSVAVSEGKPTEKHIQIR 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PEFSELFAAFPSFA-----GLRPTFDTRLMRLEDEMKEGR--YEVRAELPGVDPDK 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DVQVHYDSGKLTISGEVVNERKNESTEGNQRWSERRFGSFSRTITIPAKIDADRIEANFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PTVNDLFSDFVSYSPRLNNQIPGELSPSID-----VHEGKDTVSVDVELPGVKKE-
                                                                                                                                                                                                                                                                     D90902; BAA16996.1; -.
                                                    l Similarity
36; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      46;
                                                                                                                                                                         PS01031; HSP20; 1.
146 AA; 16596 MW;
                                                                                                                                                                                                                                                                                                3:109-136(1996)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         143 AA;
                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PubMed=8905231;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15968 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21.1%; 32.2%;
                                                                        20.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          02,
02,
14,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pathway regulates the expression hock protein in fission yeast."; the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the
                                                    19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL/GenBank/DDBJ databases
                                                 Score 149; DB 2;
Pred. No. 2.7e-06;
9; Mismatches 37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pred. No. 8.5e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 154.5;
                                                                                                                                                                         4453B15DF8F9EABE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           321D474116FCE380 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Synechocystis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    45;
                                                                                              Length 146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 143;
                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                               אני, Yasuda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Okumura
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ۵
                                                    6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Low
                                                                                                                                                                                                                                                                                                                                                                                                                .
`
                                                    Gaps
                                                                                                                                                                                                                                                                                                                         the
s.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                         s:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6,
```

В

49

EEAYVLKLELPGMDPD-NLDIQAARDAVTVSGDRQDTHSTEKDGVRRTEFRYGSFRRVIP 107

ŕ

RESULT Q9K4W0

ഗ

g 99

108

103 LPVGADEDDIKATYDKGILTVSV-AVSEGKPTEKHIQI

139

VPGAIQNTEVKANYDAGILTLTLPKVEEAKNKVVKVQL 145

```
SPRRRR
                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
 Overbeek R.,
Cotton M.D.,
Sadow P.W., D
         Klenk H.-P., Clayton R.A., Tomb J.-F., White O., Nelson K.E., Ketchum K.A., Dodson R.J., Gwinn M., Hickey E.K., Peterson J.D., Richardson D.L., Kerlavage A.R., Graham D.E., Kyrpides N.C., Fleischmann R.D., Quackenbush J., Lee N.H., Sutton G.G., Gill S., Kirkness E.F., Dougherty B.A., McKenney K., Adams M.D., Loftus B., Peterson S., Reich C.I., McNeil L.K., Badger J.H., Glodek A., Zhou Overbeek R., Gocayne J.D., Weidman J.F., McDonald L., Utterback T. Cotton M.D., Spriggs T., Artiach P., Kaine B.P., Sykes S.M.,
                                                                                                                      STRAIN=VC-16 / DSM 4304 / ATCC 49558; MEDLINE=98049343; PubMed=9389475;
                                                                                                                                                                                                                                          01-JAN-1998 (TrEMBLrel. (01-OCT-2000 (TrEMBLrel. 1)
SMALL HEAT SHOCK PROTEIN
                                                                                                                                                                                                                                                                                              028308;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Shen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
01-OCT-2000 (TrEMBLrel.
                                                                                                                                                                          Archaeoglobus.
NCBI_TaxID=2234;
                                                                                                                                                                                                   Archaeoglobus fulgidus.
Archaea; Euryarchaeota;
                                                                                                                                                                                                                                                                    01-JAN-1998
01-JAN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Expression of the Stigmatella aurantiaca hspA gene depends positively controlled heat shock response motif."; Submitted (JUL-2000) to the EMBL/GenBank/DDBJ databases. EMBL: AJ276218; CAB99442.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A. STRAIN=DW4/3-1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Stigmatella aurantiaca
                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                AF1971
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Myxococcales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria; Proteobacteria; delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q9K4W0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID-41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HSPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HSPA PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q9K4W0;
                                                                                                                                                                                                                                                                                                                                                                              135
                                                                                                                                                                                                                                                                                                                                                                                                       117
                                                                                                                                                                                                                                                                                                                                                                                                                                76
                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                      σ
                                                                                                                                                                                                                                                                                                                                                                           KNGVLTLTLPKRPEVQPKRIQVASSGTEQKEHIK 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FPEFSEL-----FAAFPSFAGLR-----PTFDTRLMRLEDEMKEGRYEVRAELPGVD 60
                                                                                                                                                                                                                                                                                                                                                                                                       DKGILTVSV--
                                                                                                                                                                                                                                                                                                                                                                                                                                 -EKDIEVTLTGDRVSVSGKREREKREESERFYAYERSFGSFSRAFTLPEGVDGDNVRADL 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FQQMQELMNWDPFELANHPWFANRQGPPAFVPAFEVR-----ETKEA-YIFKADLPGVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAY----GSFVRTVSLPVGADEDDIKATY 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Schairer H.U.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         169
                                                                                                                                                                                                                                                                                (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cystobacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ΑA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19359 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20.3%;
                                                                                                                                                                                                                                                     05,
05,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15,
15,
                                                                                                                                                                                                   Archaeoglobales;
                                                                                                                                                                                                                                          (HSP20-2).
                                                                                                                                                                                                                                                                                                                                                                                                    -AVSEGKPTEKHIQ 138
Bowman C., Fujii C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Created)
                                                                                                                                                                                                                                                                    Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 148.5; DB 2
Pred. No. 3.7e-06;
8; Mismatches 46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ODIAABO5BFE4FF6A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subdivision; Myxobacteria;
Cystobacteraceae; Stigmatella.
                                                                                                                                                                                                                                                                                                            140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            169
                                                                                                                                                                                                   Archaeoglobaceae,
                                                                                                                                                                                                                                                                                                            A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ₽
                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ب
د.
 Garland
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                      Zhou L.,
                                                    В.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7;
```

В

102 RRYGNYSRSYYVP-GVDENKISAKYENGILNLTLPKSDESQTH-HIEIQ

```
Qy
                        В
                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
P94898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                       Matches
                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                            P94898;
P94898;
01-MAY-1997
                                                                                                                                        PROSITE; PS
Heat shock.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERPRO; IPR002068; -.
PFAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
Hypothetical protein; Heat shock.
SEQUENCE 140 AA; 16537 MW; E60DB9D367BA275D
                                                                                                                                                              Appl. Environ. Microbiol. EMBL; X99468; CAA67831.1; INTERPRO; IPR002068; -. PFAM; PF00011; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                  HSP18
                                                                                                                                                                                                                                                                                                                                                             01-MAY-2000
HEAT SHOCK F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; AE000967; AAB89284.1; HSSP; Q57733; 1SHS. TIGR; AF1971; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              reducing archaeon Archae
Nature 390:364-370(1997)
                                                                                                                             SEQUENCE
                                                                                                                                                                                                            oenos."
                                                                                                                                                                                                                     "Molecular characterization of the gene encoding an 18-k: small heat shock protein associated with the membrane of
                                                                                                                                                                                                                                            Jobin M.P., Delmas F.,
                                                                                                                                                                                                                                                      MEDLINE=97176392; PubMed=9023938;
                                                                                                                                                                                                                                                                              SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                0enococcus
                                                                                                                                                                                                                                                                                                                           Bacteria;
                                                                                                                                                                                                                                                                                                                                       0enococcus
                                                                                                                                                                                                                                                                                                                                                                                  01-MAY-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mason T.M.,
Venter J.C.
                                                                                                                                                                                                                                                                                                  NCBI_TaxID=1247;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "The complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local
  92
                        43
                                               38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12
                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                               LMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTI-----KAERTEQKDLDGRSE 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VSVAVSEGKPTEKHIQI
 FAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQIR 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RRMQERFNRLLEEFGRFPEVKEFRVTMPV-----DVIDEGEQIRVVADLPGFSKE-DLE 64
                                                                                                                                                                                                                                                                                                                                                             SHOCK PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -EITIPKLKKDRKAVQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IMVRDGQLTIKAERTEQ-KDLDG----RSEFAYGSFVRTVSLPVGADEDDIKATYDKGILT 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RHPRSLEPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEG-RYEVRAELPGVDPDKDVH 66
                        IMRTDISENDKEYGLKIELPGLD-KKDIKIDYSNDNLTVSGVLSSKAEEKDKKNNVVRSE 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IYFEDGDLVIKAEKKEEFEEKKGEYLRRERRMGKVYRRIALPAGLDIDAVKAKYNNGVL-
                                                                     l Similarity
38; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               L Similarity
45; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       plete genome sequence of the hyperthermophilic, archaeon Archaeoglobus fulgidus.";
                                                                                                                                                    PS01031;
                                                                                                                                                                                                                                                                                                                           Firmicutes;
                                                                                                                              148
                                                                                                                                                                                                                                                                                                                                       oeni (Leuconostoc oenos)
                                                                                                                                                                                                                                                                                                                                                                      7 (TrEMBLrel. (7 (TrEMBLrel. (10 (TrEMBLrel. (10 (TremBLrel.))))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Olsen
                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMINARY;
                                                                                                                                                                                                                                                                              N.A.
                                                                                                                             ΑA;
                                                                                                                                                    HSP20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            G.J.,
                                                                                                                             16938 MW;
                                                                                19.9%;
34.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20.1%;
                                                                                                                                                                                                                                                                                                                           Bacillus/Clostridium
                                                                                                                                                                                                                                             Garmyn D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  139
                                                                                                                                                                                                                                                                                                                                                                       03,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Fraser C.M.,
                                                                                                                                                                                                63:609-614(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               19;
                                                                       24;
                                                                                                                                                                                                                                                                                                                                                                       Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 147; DB 1
Pred. No. 4e-06;
9; Mismatches
                                                                                Score 145.5;
Pred. No. 5.8
                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
                                                                                                                             9CA835FEA2F063B1 CRC64;
                                                                     Mismatches
                                                                                                                                                                                                                                             Divies C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Smith H.O.,
                                                                                                                                                                                                                                                                                                                                                                                                                     148
                                                                                .8e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                                                                             DΒ
                                                                                                                                                                                                                                                                                                                          group; Lactobacillaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1;
                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               59;
                                                                       38;
                                                                                                                                                                                                                                             Guzzo J.;
                                                                                           2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Woese
                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                       Indels
                                                                                                                                                                                                                                  18-kilodalton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sulphate-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .
R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14;
                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                    Gaps
                                                                     4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6;
```

```
RESULTA
O 458
ID 458
ID 458
ID 70
ID
                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SQ DR DR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 46
Heat
                                                                                                         Narberhaus F., Weiglhofer W., Fischer H.M., Hennecke H.;
"The Bradyrhizobium japonicum rpoHl gene encoding a sigma 32-like protein is part of a unique heat shock gene cluster together with groESL1 and three small heat shock genes.";
J. Bacteriol. 178:5337-5346(1996).
EMBL; U55047; AAC44757.1; -.
                                                                                                                                                                                                                                                              SEQUENCE FROM N.A. MEDLINE=96404779; PubMed=8808920;
                                                                                                                                                                                                                                                                                                                                         Bradyrhizobium japonicum.
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae
Bradyrhizobium group; Bradyrhizobium.
NCBI_TaxID=375;
                                                                                                                                                                                                                                                                                                                                                                                                                                             HSPC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SMALL HEAT SHOCK PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           P70919;
01-FEB-1997 (TrEMBLrel.
01-FEB-1997 (TrEMBLrel.
01-MAY-2000 (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                P70919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q96458;
01-FEB-1997 (TrEMBLrel. 02, Created)
01-FEB-1997 (TrEMBLrel. 02, Last sequence update)
01-MAY-2000 (TrEMBLrel. 13, Last annotation update)
17 KDA CLASS I SMALL HEAT SHOCK PROTEIN.
                                           PROSITE; PS01031;
                                                                INTERPRO; IPR002068; PFAM; PF00011; HSP20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN=CV. SUNDANCE; TSlocombe S.P., Barker
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hordeum vulgare (Barley).
Eukaryota; Viridiplantae;
Magnoliophyta; Liliopsida;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MENDEL; 8559; Horvu;1195;8559.
INTERPRO; IPR002068; -.
PFAM; PF00011; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PFAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL; Y07844; CAA69172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Halford N.G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HSP17.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (SEP-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=4513;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q96458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       æ
               shock.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FPEFSELFA-----AFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDV 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LTVTVPKTEVKKPEVKAIEI 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LTVSVAVSE-GKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KVEVEDGNVLVVSGERTKEKEDKNDKWHRVERSSGKFVRRFRLPEDAKVEEVKAGLENGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FDPFADLWADPFDTFRSIVPAFSGNSETAAFANARVDWKETPEAHVFKADLPGVKKE-EV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SUNDANCE; TISSUE=SEED;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ΑA;
                                         HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             16842 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     J.H.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              02,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HSPC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Embryophyta; Trac;
; Poales; Poaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 144.5;
Pred. No. 7.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Beaudoin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14E540880EEB1ABE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                166 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     F .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tracheophyta; Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .3e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Dickinson J.R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hordeum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 150;
                                                                                                                                                                                                                                                                                                                                                                                            group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5
```

```
AC AC
                    Q9SE11
                               RESULT 11
                                                                  밁
                                                                                      ρy
                                                                                                              밁
                                                                                                                                 Ş
                                                                                                                                                         DЬ
                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SO
                                                                                                                                                                                                                Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
Q9SE11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q40056;
Q40056;
01-NOV-1996
01-NOV-1996
01-MAY-2000
17 KDA HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HSP17
                                                                                                                                                                                                                                                                                                    EMBL; X64560; CAA45861.1; -. MENDEL; 8557; HOTVU;1195;8557 INTERPRO; IPRO02068; -.
                                                                                                                                                                                                                                                                                                                                                            "Identification, characterization, and analysis of cDNA and genomic sequences encoding two different small heat shock proteins in Hordeum
                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE .....
STRAIN-CV. ONICE;
MEDLINE-94156165; PubMed-8112573;
MEDLINE-94156165; PubMed-8112573;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hordeum vulgare (Barley).
Eukaryota; Viridiplantae;
Magnoliophyta; Liliopsida;
NCBI_TaxID-4513;
                                                                                                                                                                                                                                                                     PROSITE; PS01031; HSP20; 1. Heat shock.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                       Genome 36:1111-1118(1993).
                                                                                                                                                                                                                                                                                                                                                                                   Perrotta C.;
                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                            PFAM; PF00011;
                                                                                                                                                                                                                                                                                                                                                  vulgare.
                                                                  117
                                                                                       108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          139
                                                                                                             58
                                                                                                                                   53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               28
                                                                                                                                                         ш
                                                                                                                                                                              4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10
                                                                                                                           RAELPGVDPDKDVHIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGA 107
                                                                 KVDEVKAGLENGVLTVTVPKAEVKKPEVKAIEI
                                                                                      DEDDIKATYDKGILTVSVAVSE-GKPTEKHIQI
                                                                                                                                                         MSIVRRSNVLDP-FADLWADPLDTFRSIFPAISGGNSETAVRERRM--DWKGRRLEAHVF
                                                                                                                                                                              LPVQRHPRSLFPEFSELFA----AFPSFAGLRPTFDTRLMRLEDEMKEGRYEV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FKNGVLTITVPKSAEAKNVRRIAI 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LPVQRHPRSLFPEFSELF -- AAFPSFAGLR -- -- PTFDTRLMRLEDEMKEGRYEVRAELP
                                                                                                             KADLPGVKKE-EVKVEVEDGNVLIVSGERTKEKEDKNDKWHRVERRSGKFVRPFRLPEDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YDKGILTVSVAVSEGKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GLE-EKDVSLEIANGVLSISGEKKSESEDKARRFSERYYGRFERRIPLE-GIDEDKVSAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVDPDKDVHIMVRDGQLTIKAERTEQKDLDGR--SEFAYGSFVRTVSLPVGADEDDIKAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LTLHREMNRMFDEVFRGFDLAPFGSSRGLSGLGWPQID----
                                                                                                                                                                                                     l Similarity
51; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6 (TrEMBLrel. 01. 0 (TrEMBLrel. 13. T SHOCK PROTEIN.
                                                                                                                                                                                                                                                           151 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 166
                                                                                                                                                                                                     Conservative
           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (TrEMBLrel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA;
                                                                                                                                                                                                                                                                                            HSP20;
                                                                                                                                                                                                                                                             17092 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18603 MW;
                                                                                                                                                                                                                19.2%;
33.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19.5%;
32.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    01,
01,
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Embryophyta; Trac
Poales; Poaceae;
                                                                                                                                                                                                     24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Created)
                                                                                                                                                                                                               Score 140.5; DB 1
Pred. No. 1.7e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 142.5; DB 2
Pred. No. 1.3e-05;
           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               139
                                                                                                                                                                                                                                                             44EFB8A839C953F1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3EBFE569D7FC2082 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                             ر
و.,
           243
                                                                                                                                                                                                                                                                                                                                                                                             Hartings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  151
                                                                                       139
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Tracheophyta; ceae; Hordeum.
                                                                  149
           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₽
                                                                                                                                                                                                                          DB 10;
                                                                                                                                                                                                     57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           57,
                                                                                                                                                                                                                                                                                                                                                                                             Η.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IDETDKEVR - - ITAELP
                                                                                                                                                                                                                                                                                                                                                                                             Raho G.,
                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 166;
                                                                                                                                                                                                                           Length 151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         17;
                                                                                                                                                                                                     21;
                                                                                                                                                                                                                                                                                                                                                                                             Conte M.R.,
                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  57.
                                                                                                                                                                                52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         115
                                                                                                                                                           57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               80
                                                                                                                                                                                                     8
```

1

```
RESULT
Q9ZFD1
ID Q9
AC Q9
DT 01
DT 01
DT 01
DE SM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                       RT DR RT DR CW
                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
В
                                             Query Match
Best Local S
Matches 41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 41
                                                                                                                                        Michelini E.T., Flynn G.C.;
"The unique chaperone operon of Thermotoga maritima: clo
initial characterization of a functional Hsp70 and sHsp.
submitted (NOV-1998) to the EMBL/GenBank/DDBJ databases.
EMBL; AF106330; AAC79726.1; -
INTERRON; IPR002068; -
PFAM; PF00011; HSP20; 1.
                                                                                                                                                                                                                                                                                                          01-MAY-1999 (TrEMBLrel. 10, 01-MAY-1999 (TrEMBLrel. 10, 01-MAY-2000 (TrEMBLrel. 13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Waters E.R., Vierling E.;
"Chloroplast small heat shock proteins: Evidence fo evolution of an organelle-localized protein.";
Proc. Natl. Acad. Sci. U.S.A. 96:14394-14399(1999).
EMBL; AF197942; AAF19022.1; -.
INTERPRO; IPR002068; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Funaria hygrometrica.
Eukaryota; Viridiplantae;
Funariidae; Funariales; Fu
NCBI_TaxID=29583;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-MAY-2000 (TrEMBLrel.
01-MAY-2000 (TrEMBLrel.
01-JUN-2000 (TrEMBLrel.
CHLOROPLAST-LOCALIZED SW
                                                                                                                                                                                                                                                                        Thermotoga maritima
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CPSHSP22
                                                                                                                                                                                                                         SEQUENCE FROM N.A
                                                                                                                                                                                                                                                              Bacteria;
                                                                                                                                                                                                                                                                                      SHSP
                                                                                                                                                                                                                                                                                                                                              Q9ZFD1
                                                                                                                                                                                                                                                                                                                                                          Q9ZFD1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                             PROSITE;
                                                                                                                                                                                                                                                 NCBI_TaxID=2336;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                         138
                                                                                                                                                                                                                                                                                                                                                                                                                    239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21
                                             Local Similarity
nes 41; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
16
                                                                                                                                                                                                                                                                                                                                                                                12
                      σ
                                                                                                                                                                                                                                                                                                                                                                                                                                         ΩĪ
                                                                                                                   shock.
                                                                                                                                                                                                                                                                                                                                                                                                                    DΙ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FSAAPS----RPTGIALDFRTPWDVKEDNESFRLRFDMPGLGKD-EVKVYVEDGDLVIKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FAAFPSFAGLRPTFDTRLMRLEDEMKEGR--YEVRAELPGVDPDKDVHIMVRDGQLTIK-
LQREIDRLFDDFFR---
                      VQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AHRAEEQKENNWSSRSYGSYNTRMTLPENVKIDEVKAELKNGVLQVVVPKSKEEPKKNVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PF00011; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                         139
                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FROM N.A.
                                                                                                                             PS01031; HSP20; 1.
                                                                                                                                                                                                                                                          Thermotogales;
                                                                                                                                                                                                                                                                                                SHOCK PROTEIN.
                                                                                                       142 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        243 AA;
                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        27468 MW;
                                                                                                       17006 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19.2%;
                                                           18
29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1. 13, Last sequence update)
1. 14, Last annotation update
SMALL HEAT SHOCK PROTEIN 22.
                                                        . 78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 e; Embryophyta; Bryophyta;
Funariaceae; Funaria.
                                                                                                                                                                                                                                                            Thermotoga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23;
-TEVRPAPDMDVFETDDEV----VIEVEIPGID-RKDV
                                             25;
                                         Score 138.5;
Pred. No. 2.4e
25; Mismatches
                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 140; DB 10;
Pred. No. 3.4e-05;
3; Mismatches 5(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EA45002D4C1B690B CRC64;
                                                                                                       D7B6B0C75D08F565 CRC64;
                                       8.5; L.
o. 2.4e-05;
                                                                                                                                                                                                                                                                                                                                                          AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bryopsida;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                             Indels
                                                                   Length
                                                                                                                                                                                         sHsp.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       atypical
                                                                                                                                                                                                 cloning
                                             19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8;
                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                      65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       77
6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4;
                                             5.
```

```
RESULT
069243
                                                                                                                                                                                                                                                                                                              RESULT
Q40867
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCOMPANDA 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
  RC OCC
                                                                                                                                                                                                                                                                                                                                                                                                         Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                    Q40867; PRELIMINARY;
Q40867; O1-NOV-1996 (TrEMBLrel. 0
01-NOV-1996 (TrEMBLrel. 0
01-NOV-1996 (TrEMBLrel. 0
1-MAY-2000 (TrEMBLrel. 1
1-HEAT SHOCK PROTEIN 17.9.
HSP17.9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       069243;
01-AUG-1998
01-AUG-1998
01-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bradyrhizobium japonicum.
Bacteria; Proteobacteria; alpha subdivision;
Bradyrhizobium group; Bradyrhizobium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HSPF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HSPF
                                                          Eukaryota; Viridiplantae; Embryophyta; Magnoliophyta; Liliopsida; Poales; Poac MCBI_TaxID=4543;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Narberhaus F., Weiglhofer W., Fischer H.M., "The Bradyrhizobium japonicum rpoHl gene enc protein is part of a unique heat shock gene großil and three small heat shock genes."; J. Bacteriol. 178:5337-5346(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-98283699; PubMed-9622356;
Narberhaus F., Kaeser R., Nocker A., Hennecke
"A novel DNA element that controls bacterial
expression.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  069243
SEQUENCE FROM N.A STRAIN=LRE179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PFAM; PF00011; HSP20; 1. PROSITE; PS01031; HSP20; 1.
                                                                                                                               Pennisetum americanum (Pearl millet).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             vEDLINE=96404779; PubMed=8808920;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INTERPRO; IPR002068;
                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                     100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13
                                                                                                                                                                                                                                                                                                                                                                                                      RI--PVDDVDQDKVAASFKDGILTVTLPKS---PTEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMKEGRYEVR--AELPGVDPDKDVHIMVRDGQLTIKAE-RTEQKDLDGR-SEFAYGSFVR 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TIRVPKKEER-KKKVIEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HIMVRDGQLTIKAERTEQKDLDGRS----EFAYGSFVRTVSLPVGADEDDIKATYDKGIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                  TVSLPV-GADEDDIKATYDKGILTVSVAVSEGKPTEK 135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Microbiol. 28:315-323(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TVSVAVSEGKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EFNETDKEVKVIAELPGIE-QKDVEVELADGVLTISGEKKSETKDKERRFSERYYGRFER 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QITVEENILKISGEKKLEREQKGKNYYYVERSAGKFERAIRLPDYVDVEKIKAEYKNGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (TrEMBLrel.) (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    163 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18.8%;
                                                                                                                                                                                                 01,
01,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       07,
07,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16;
                                                                                                                                                                                                   Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Last sequence update)
Last annotation updat
                                                                                                                                                                                                                                                 Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score
Pred.
                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6EB5CAACE066028E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            137.5;
No. 3.5
                                                                                      Poaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hennecke
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  163
                                                                                                                                                                                                                                                                                              159
                                                                                                             Tracheophyta;
                                                                                                                                                                                                                                                                                           AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .5e-05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       encoding a sigma 32-like ene cluster together with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DΒ
                                                                                                                                                                                                                                                                                                                                                                                                           152
                                                                                 neopnyta; Spermatophyta; Pennisetum.
                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hennecke H.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rhizobiaceae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          heat shock gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Η.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
```

7;

```
Ş
                                    В
                                                             Q
                                                                                                                                                                 SO DR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 18.7
Best Local Similarity 30.8
Matches 41; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   est Local Similarity
                                                                                                                                             ROY S.K., Nakamoto H.;

Roy S.K., Nakamoto H.;

"Cloning, characterization, and transcriptional analysis of a gene encoding an alpha-crystallin-related, small heat shock protein from the thermophilic cyanobacterium Synechococcus vulcanus.";

J. Bacteriol. 180:3997-4001(1998).

EMBL; AB002666; BAA32501.1; -.

INTERPRO; IPR002068; -.

PFAM; PF001011; HSP20; 1.

PROSITE; PS010311; HSP20; 1.

PROSITE; PS01031; HSP20; 1.

SEQUENCE 145 AA; 16650 MW; D21B30C1CBACE956 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                      O82825;
01-NOV-1998
01-NOV-1998
01-MAY-2000
                                                                                                                                                                                                                                                                                                                                               HSPA.
Synechococcus vulcanus.
Bacteria; Cyanobacteria; Chroococcales; Synechococcus.
RCBI_TaxID=32053;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-97156146; PubMed-9002606;
Caven G.P., Skot K., Stevens M.J., Howarth C.J.;
Caven G.P., Skot K., Stevens M.J., Howarth C.J.;
"Sequence homology requirements for transcriptional silencing of 35s
transgenes and post-transcriptional silencing of nitrite reductase
(trans)genes by the tobacco 271 locus.";
Plant Mol. Biol. 30:1075-1075(1996).
EMBL; 94193; CAMG3903.1; -.
MENDEL; 9759; Pengl;1195;9759.
INTERPRO; IPRO02068; -.
                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A. MEDLINE-98348466; PubMed-9683501;
                                                                                                                                                                                                                                                                                                                                                                                                           HSPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               082825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PFAM; PF00011; HSP20; 1. PROSITE; PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A. STRAIN-LRE179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Cavan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Submitted (DEC-1995) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   144 KEEVKKPEVKSIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             127 VSE-GKPTEKHIQI 139
                                    15
√5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12
                                                                σ
        PDKDVHIMVRDGQLTIKAERTEQ--KDLDG--RSEFAYGSFVRTVSLPVGADEDDIKATY 116
                                    IQRQMNRLFDELIPLTERRSDLSFLPAAELEETPEALLLKV-----
                                                               VQRHPRSLFPEFSELF----AAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GNVLQISGERNKEQEEKTDTWHRVERSSGKFWRRFRLPENAKTDQIRASMENGVLTVTVP 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GQ-LTIKAERT----EQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVA 126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLFPSFPRTSSETAAFAG------ARIDWKETPEAHVFKADVPALKKE-EVKVEVED 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRD 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          shock.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ດ
: :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      44;
                                                                                                                                                                                                                                                                                                                                                                                                                      (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             159 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17946 MW;
                                                                                           18.7%; Sc
30.8%; Pr
tive 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18.7%;
32.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                       08,
08,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21;
                                                                                                                                                                                                                                                                                                                                                                                                                    Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 137; DB 10;
Pred. No. 3.8e-05;
1; Mismatches 53;
                                                                                           Score 136.5; DB 2;
Pred. No. 3.7e-05;
1; Mismatches 48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C308EF7E15126C03 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               145 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 159;
                                                                                            Indels
                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                   -----ELPGMD 61
                                                                                                                       145;
                                                                                           23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16;
                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                           5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5
```

```
Db 62 P-KDIDVQVTAEAVSISGERKSETKTETEGMKRTEFRYGKFQRVIPLPVRIQNTSVKAEY 120

QY 117 DKGILTVSVAVSE 129
```

Search completed: January 5, 2001, 14:30:45 Job time: 337 sec

В

121 KDGILHLTLPKAE 133

```
Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tal number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ŏ
       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
     119
118.5
118.5
117.5
117.7
116
116.1
111.5
1112.5
1112.5
119.5
109.5
109.5
                                                                                                                                                                                                                                                                   130
127.5
126.5
126.5
124.5
124.5
123.5
123.5
123.5
123.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 718
148.5
137.5
130.5
130.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       length:
length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
     January 5, 2001, 14:31:21; Search time 35.06 Seconds (without alignments) 131.719 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SwissProt_39:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             88757 seqs, 32294092 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-461-774-8
731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version
Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATTLPVQRHPRSLFPEFSEL.....SVAVSEGKPTEKHIQIRSTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20000000000
     DВ
   14KD_MYCTU
SP21_STRA
HS12_DAUCA
HS11_WHEAT
HS11_HELAN
HS16_YEAST
HS12_ORYSA
HS11_ARATH
HS11_ARATH
HS11_ARATH
HS11_ARATH
HS11_BOYSA
HS18_STRAI
HS12_OYSA
HS18_STRAI
HS11_ARATH
HS11_PEA
HS11_PEA
HS11_PEA
HS11_PEA
HS11_PEA
HS11_PEA
HS11_PEA
HS11_PEA
HS11_SOYBN
HS11_BOYBN
HS11_BOYBN
HS11_BOYBN
HS11_BOYBN
HS11_BOYBN
HS11_DAUCA
HS11_DAUCA
HS11_DAUCA
HS11_DAUCA
HS11_DAUCA
HS11_SOYBN
HS11_DAUCA
HS11_SOYBN
HS11_BOYBN
HS11_BOYBN
HS11_SOYBN
HS11_BOYBN
HS11_BOYBN
HS11_BOYBN
HS11_BOYBN
HS11_BOYBN
HS11_SOYBN
HS11_SOYBN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4.5
Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P30223 mycobacteri
Q06823 stigmatella
P12811 chlamydomon
P80485 streptococc
P27397 daucus caro
   P19036
P19036
P19777
P27777
Q53595
Q956221
P302244
P019243
P19243
P19243
P19243
P19243
P19243
P302851
P302851
P302851
P30297
P40920
P40920
P40920
P40920
P301794
P3017
                                                                                                                                                                                                                                                                                                                                                                        P12810
P30693
P05478
Q05832
P15992
P31673
P13853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Description
810 triticum ae
693 helianthus
478 glycine max
832 chenopodium
992 saccharomyc
673 oryza sativ
853 arabidopsis
036 arabidopsis
037 arabidopsis
038 arabidopsis
044 pisum sativ
0519 glycine max
0519 glycine max
0519 glycine max
0520 emericella
0530 daucus caro
0550 daucus caro
```

ALIGNMENTS

888888	38888	RA RA RA RA RT	RA RA	R R R R R R R R R R R R R R R R R R R	RR	RESULT 14 KD_M 10 1 AC P DT 0 DT 0 DT 3 DT 3 DE 1 GN H OC B OC B OC B
his SWISS-PROT entry is copyright. It is produced through a collaborati netween the Swiss institute of Bioinformatics and the EMBL outstation be European Bioinformatics Institute. There are no restrictions on ise by non-profit institutions as long as its content is in no woodified and this statement is not removed. Usage by and for commerciantities requires a license agreement (See http://www.isb-sib.ch/announcentities requires a license agreement (See	1644 (1998) LOCATION METRY: MI BELONGS	Lagsham D., Brown D., Chillingworth St., Seltin K., Feltwell T., Gentles S., Lagels K., Krogh A., McLean J., McSborne J., Quail M.A., Rajandream seger K., Skelton S., Squares S., hitehead S., Barrell B.G.; the biology of Mycobacterium tubome sequence.";	SEQUENCE FROM N.A. SEQUENCE FROM N.A. STRAIN=H37EV, MEDLINE=98295987; PubMed=9634230; Golde S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris D., Gordon S.V., Eigimeier K., Gas S., Barry C.E. III, Tekala F.,	SEQUENCE, AND CHARACTERIZATION. STRAIN-ERDMANN; MEDLINE-92225631; PubMed-1563797; Lee BY., Hefta S.A., Brennan P.J.; "Characterization of the major membrane protein of virulent Mycobacterium tuberculosis."; Infect. Immun. 60:2066-2074(1992).	SEQUENCE FROM N.A. SEQUENCE FROM N.A. SEQUENCE FROMANN, AND H37RV; MEDLINE=92138631; PubMed=1370952; Werbon A., Hartskeerl R.A., Schuitema A., Kolk A.H.J., Young D.B., Lathigra R.; "The 14,000-molecular-weight antigen of Mycobacterium tuberculosis is related to the alpha-crystallin family of low-molecular-weight heat shock proteins."; J. Bacteriol. 174:1352-1359(1992).	RESULT 1 14KD_MYCTU STANDARD; PRT; 143 AA. 11 14KD_MYCTU STANDARD; PRT; 143 AA. 12 14KD_MYCTU STANDARD; PRT; 143 AA. 13 14KD_MYCTU STANDARD; PRT; 143 AA. 14 14 15 15 15 15 15 15 15 15 15 15 15 15 15

```
RESULT
SP21_SP
ID SE
AC QO
DT 0:
DT 1:
DE SI
GN H:
CO SI
OC B:
CO SI
SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
OC SI
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIR; A42651; A42651.
PIR; A43823; A43823.
TUBERCULIST; RV2031C; -.
INTERPRO; IPRO02068; -.
PFAM; PF00011; HSP20; 1.
    use by modified
                                                      the
                                                                                                      This
                                                                                                                                                                                                                                                                "Heidelbach M., Skladny H., Schairer H.U.;
"Purification and characterization of SP21, a development-specific protein of the myxobacterium Stigmatella aurantiaca.";
J. Bacteriol. 175:905-908 (1993).
-!- FUNCTION: MAY STABILIZE CELLULAR COMPONENTS DURING STRESS AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Headelbach M., Skladny H., Schairer H.U.;
"Heat shock and development induce synthesis low-molecular-weight stress-responsive protei Stigmatella aurantiaca.";
Bacteriol. 175:7479-7482(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q06823;
01-JUN-1994
                                                                               between
                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=93139064; PubMed=8423161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-DW4/3-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-JUN-1994
15-JUL-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STIAU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=94042926; PubMed=8226695;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SP21_STIAU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; M76712; AAA25342.1; -. EMBL; AL021899; CAA17245.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                         PARTIAL SEQUENCE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROSITE; PS01031; HSP20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        send
    s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the ENE European Bioinformatics Institute. There are no restrictly non-profit institutions as long as its content in the statement is not removed. Usage by and
                                                                                                                                                                       DEVELOPMENTAL STAGE: DURING FRUITING AND UPON INDUCED SPORULATION INDUCTION: BY STRESS, SUCH AS HEAT SHOCK AND OXYGEN LIMITATION. SIMILARITY: BELONGS TO THE SMALL HEAT SHOCK PROTEIN (HSP20)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLFVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PDKDVDIMVRDGQLTIKAERTEQKDFDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S79751; AAB21317.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           an
                                                                                                                                                                                                                                                 FORMATION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aurantiaca.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (Rel. 29, Created)
(Rel. 29, Last sequence up
(Rel. 36, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ceobacteria; delta
Cystobacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16096 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98.2%;
98.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          751AD94203226CE9 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    subdivision; Myxol
Cystobacteraceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         718;
No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein
                           There are no restrictions ng as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .6e-58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Myxobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the myxobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Stigmatella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
       and for
                                                                             EMBL
                        15
                                                                                                      ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                              collaboration
                                                                             outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
       commercia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                             on
                                                    its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
```

```
RESULT
HS2C_CI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       멓
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PFAM; PF00011; HSP20; 1.
PROSTTE; PS01031; HSP20; 1
Heat shock; Sporulation.
SEQUENCE 188 AA; 21252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HS2C_CHLRE
P12811;
01-OCT-1989
                                                                                                                                                                                                                                                                                                                                                                                           Chlamydomonas. Evidence for translocation into the organ a processing step.";
Eur. J. Biochem. 182:539-546(1989).
-!- SUBCELLULAR LOCATION: CHLOROPLAST.
-!- INDUCTION: REGULATED BY LIGHT ONLY UPON HEAT SHOCK.
-!- SIMILARITY: BELONGS TO THE SMALL HEAT SHOCK PROTEIN
                                                                                      EMBL; X15053; CAA33152.1; PIR; S04939; S04939. INTERPRO; IPR002068; -.
                                                                                                                                                                               entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                    modified and this statement is not removed entities requires a license agreement (See
                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Enthe European Bioinformatics Institute. There are no restricted the succession of the succession
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Kloppstech K., Ohad I.;
"The nuclear-coded chloroplast 22-kDa heat-shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=89325298; PubMed=2473899;
Grimm B., Ish-Shalom D., Even D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Chlamydomonas reinhardtii.
Eukaryota; Viridiplantae; Chlorophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-OCT-1989 (Rel. 12, Created)
01-OCT-1989 (Rel. 12, Last sequence up
01-UUL-1993 (Rel. 26, Last annotation
CHLOROPLAST HEAT SHOCK 22 KDA PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-Y-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Chlamydomonadaceae; Chlamydomonas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CHLRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PIR; S27669; S27669
PIR; A49942; A49942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; M94510; AAA16136.1; -. PIR; S27669; S27669.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                           PROSITE;
                                                                   PFAM; PF00011; HSP20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                     ieat shock;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KNGVLTLTLPKRPEVQPKRIQVASSGTEQKEHIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DKGILTVSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FPEFSEL-----FAAFPSFAGLR-----PTFDTRLMRLEDEMKEGRYEVRAELPGVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAY----GSFVRTVSLPVGADEDDIKATY 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FQQMQELMNWDPFELANHPWFANRQGPPAFVPAFEVR----ETKEA-YIFKADLPGVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -EKDIEVTLTGDRVSVSGKREREKREESERFYAYERTFGSFSRAFTLPEGVDGDNVRADL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                        PS01031; HSP20; 1.
                                                                                                                                                                                                                                                    non-profit institutions as long
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ish-Shalom D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sporulation.
188 AA; 21253 MW;
                   Chloroplast
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ۳
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -AVSEGKPTEKHIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 148.
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    31845A76584A286F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Glaczinski H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            148.5;
No. 8.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Chlorophyceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .7e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AΑ
                                                                                                                                                                                                                                                  as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB
                                                                                                                                                                                                                               Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    46;
                                                                                                                                                                                                                                                    its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protein of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ottersbach
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              organelle
                                                                                                                                                                                                                                                                               restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Volvocales
                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                (HSP20)
                                                                                                                                                                                                                                                                                                  EMBL outstation
                                                                                                                                                                                                                                                                                                                            ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    37;
                                                                                                                                                                                                                                 tor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ъ
.
                                                                                                                                                                                                                                                                                                                          collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   without
                                                                                                                                                                                                                                                         ī,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                 n no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        75
                                                                                                                                                                                                                                                                               on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7;
```

16704

WW;

5A56FAE54D76F2AF CRC64;

٦

```
RESULT 5
HS12_DAUCA
ID HS12_D
AC P27397
DT 01-AUG
DT 01-AUG
DT 01-NOV
                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4998B
                                                                                 밁
                                                                                                Qy
                                                                                                                   뭕
                                                                                                                                  δÃ
                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 4
ASP1_STRTR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                          Matches
                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
01-AUG-1992
01-AUG-1992
01-NOV-1995
                                                                                                                                                                                                                                   INTERPRO; IPRO02068; -.
PFAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                             "A 16 KDB PACKET.";
PB18 in acid environments.";
Microbiology 143:1587-1594(1997).
-!- INDUCTION: OVEREXPRESSED IN ACID
-!- INDUCTION: PELONGS TO THE SMALL
                                                                                                                                                                                                                                                                                                                  MEDLINE=97311999; PubMed=9168610;
Gonzalez-Marquez H., Perrin C., Bracquart
"A 16 kDa protein family overexpressed by
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Streptococcus thermophilus Bacteria; Firmicutes; Baci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                P80485; P80914;
01-NOV-1997 (Rel. 35, Created)
15-JUL-1998 (Rel. 36, Last sequence up
30-MAY 2000 (Rel. 39, Last annotation
                           HS12_DAUCA P27397;
                                                                                                                                                                                                                                                                                                                                                                                          van Dorssellaer A.,
"Identification and
                                                                                                                                                                                                                                                                                                                                                                                 Streptococcus thermophilus
                                                                                                                                                                                                                                                                                                                                                                                                           Gonzalez-Marquez H.,
                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-PB18;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACID SHOCK PROTEIN (T786P28D).
                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 1-10.
                                                                                                                                                                                                                                                                                                                                                                          Submitted (FEB-1997)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ASP1_STRTR
                                                                                 122
                                                                                                 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    104
                                                                                                                   66
                                                                                                                                     69
                                                                                                                                                       17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       50
                                                                                                                                                                        10
                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                        FAMILY
                                                                               VLKVTLPKDSNKEIKKSISI 141
                                                                                                                   YENGVLTISG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PENANPDGITAAMDKGVLVVTVPKREPPAKPEPKRIAV 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YEVRAELPGVDPDKDVHIMVRDGQLTIKAERT----EQKDLDG----RSEFAYGSFVRTVSL 103
                                                                                                 ILTVSVAVSEGKPTEKHIQI 139
                                                                                                                                    VRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVS-----LPVGADEDDIKATYDKG 119
                                                                                                                                                       PEDEFEEESRNLENDE----KPNE---
                                                                                                                                                                        PRSLFPEFS-ELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIM 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PVGADEDDIKATYDKGILTVSVAVSE--GKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FELHADAPGMGPD-DVKVELQEGVLMVTGERKLSHTTKEAGGKVWRSERTAYSFSRAFSL 116
                                                                                                                                                                                        ch 17.9%; l Similarity 29.3%; 41; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
(Rel.
(Rel.
(Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                   STANDARD;
23,
23,
32,
                                                                                                                   -QQQIDAVNEDKKGKLIRSERSLTSVQRQYLLENVKEDEIKASYSDG
                                                                                                                                                                                                                                                                                                                                                                                           characterization of
                                                                                                                                                                                                                                                                                                                                                                                                  Sorokine O.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 18.8%;
                                                                                                                                                                                                                                                                                                                                                                          to the SWISS-PROT
Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacillus/Clostridium
                                                                                                                                                                                                                                     WW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14;
                                                                                                                                                                                         22;
                                                                                                                                                                                        Score 130.5; DB 1;
Pred. No. 2.7e-05;
2; Mismatches 52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 137.5;
Pred. No. 6.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                     0B57D9AEF8E030EA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                       -IKTDIHETDNEYLVEAELPGI-PKENIQVT
                                                                                                                                                                                                                                                                                                                                                                                                            Guimont C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  on update)
                                                                                                                                                                                                                                                                                 ENVIRONMENTS.
HEAT SHOCK PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       142
                                   159
                                                                                                                                                                                                                                                                                                                                                                          data
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6.9e-06;
                                                                                                                                                                                                                                                                                                                                                                                           an
                                   Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                   P., Guimont C., Linden G.;
Streptococcus thermophilus
                                                                                                                                                                                                                                                                                                                                                                                          acid shock protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       group; Streptococcaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    139
                                                                                                                                                                                                                                                                                                                                                                          bank
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         37;
                                                                                                                                                                                                                                                                                                                                                                                                            Linden
                                                                                                                                                                                         Indels
                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                            G.,
                                                                                                                                                                                                                                                                                 (HSP20)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          157;
                                                                                                                                                                                         25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9;
                                                                                                                                                                                                                                                                                                                                                                                           in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                        Gaps
                                                                                                                                                       65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4;
                                                                                                                                                                                         6,
Qy
                                                                                                                                                                                                                                              B
                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                             В
```

```
RESULT 6
HS11_WHEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
Matches 35
                                                                                                                                                                                                                                                                                                                                                     HS11_WHEAT
P12810;
                                                                                                                                                                                                                                       01-OCT-1989 (Rel. 12, Created)
01-OCT-1989 (Rel. 12, Last sequence update)
01-FEB-1994 (Rel. 28, Last annotation update)
16.9 KDA CLASS I HEAT SHOCK PROTEIN (LOW MOLECULAR WEIGHT HEAT PROTEIN) (HEAT SHOCK PROTEIN 17) (HSP 16.9).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PROSITE; PSO1031; House, Heat shock; Multigene family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWI
between
                 MEDLINE-89160335; PubMed-2922294;
McElwain E.F., Spiker S.;
"A wheat cDNA clone which is homologous
protein gene family of soybean.";
Nucleic Acids Res. 17:1764-1764(1989).
                                                                                                                                            SEQUENCE FROM N.A
                                                                                                                                                                                 Magnoliophyta;
                                                                                                                                                                                   Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Triticum.
                                                                                                                                                                                                                            Triticum aestivum (Wheat).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; X53852; CAA37848.1; PIR; S15000; CYPZ79.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            modified and this statement is not removed. entities requires a license agreement (See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     use
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               heat shock proteins from carrot.";
Plant Mol. Biol. 16:729-731(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Magnoliophyta; eudicotyledons; core eudicots;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Viridiplantae; Embryophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18.0 KDA CLASS I HEAT SHOCK PROTEIN (CLONE Daucus carota (Carrot)
                                                                                                                         STRAIN=CV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Darwish K., Wang L., Hwang C.H., Apuya "Cloning and characterization of genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-91329706;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=CV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    euasterids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERPRO; IPR002068; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   125 NVDEVKAGMENGVLTVTVPKVEMKKPEVKSIHI 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SIMILARITY: PLANTS HAVE FOUR WHICH ARE CYTOPLASMIC; CLASS AND CLASS IV WHICH IS IN THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SUBUNIT: FORMS OLIGOMERIC STRUCTURES.
SUBCELLULAR LOCATION: CYTOPLASMIC.
SIMILARITY: BELONGS TO THE SMALL HEAT
SUBUNIT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TO CLASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DEDDIKATYDKGILTVSV-AVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RAELPGVDPDKDVHIMVRDGQ-LTIKAERTEQKDLDG----RSEFAYGSFVRTVSLPVGA 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PF00011; HSP20; 1.
TE; PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DANVERS HALF-LONG;
329706; PubMed=1840684;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               II; Apiales; Apiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
FORMS OLIGOMERIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ħ,
                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      17.9%;
37.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 130.5;
Pred. No. 3e
STRUCTURES
                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        46B004F4921D64B8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CLASSES OF HSP20: CLASS I AND II III WHICH IS IN THE CHLOROPLAST ENDOMEMBRANE. THIS PROTEIN BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Daucus
                                                                                                                                                                                                                                                                                                                                                                             151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        encoding low molecular weight
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N., Zimmerman J.L.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Tracheophyta; Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      There are no restrictions
                                                          to
                                                                                                                                                                                                                                                                                                                                                                             ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SHOCK PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 1;
                                                          the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DCHSP17.9).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Asteridae
                                                              17
                                                            ĸd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  γď
                                                            heat-shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ch/announce/
                                                                                                                                                                                                                                                                       SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     way
```

```
RESULT
HS11_HI
CREER REPORT OF THE PROPERTY O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PACI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; X13431; CAA31785.1; -.
PIR; S03178; HHWT17.
INTERPRO; IPRO202068; -.
PPAM; PF00011; HSP20; 1.
PROMITE; PS01031; HSP20; 1.
Heat shock; Multigene family.
SEQUENCE 151 AA; 16878 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-APR-1993
15-JUL-1998
17.6 KDA CLA
                         Carranco R., Almoguera C., Jordano J.;
"A plant small heat shock protein gene express
embryogenesis but noninducible by heat stress.
J. Biol. Chem. 272:27470-27475(1997).
                                                                                                                                                                                                                                                                                                                                             STRAIN=CV. SUNWEED; TISSUE=SEED; MEDLINE=92353387; PubMed=1386536;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Helianthus annuus (Common sunflower).
Eukaryota; Viridiplanthee; Embryophyta; Trachec
Magnoliophyta; eudicotyledons; core eudicots;
euasterids II; Asterales; Asteraceae; Asteroic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-APR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HELAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWI
between
                                                                                                                               MEDLINE=98001736; PubMed=9341201;
                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P30693;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   use by non-profit institutions as long a
modified and this statement is not removed
entities requires a license agreement (See l
or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                Plant Mol. Biol. 19:781-792(1992)
                                                                                                                                                                                                                                                                                                                       Almoguera C., Jordano J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HS11_HELAN
                                                                                                                                                                                                                                                                  "Developmental and environmental concurrent expression of sunflower dry-seed-stored low-molecular-weight heat-shock protein and Lea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity 30.8 nes 44; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SUBCELLULAR LOCATION: CYTOPLASMIC.
SIMILARITY: BELONGS TO THE SMALL HEAT SHOCK PROTEIN (HSP20)
FAMILY.
SIMILARITY: PLANTS HAVE FOUR CLASSES OF HSP20: CLASS I AND II
WHICH ARE CYTOPLASMIC; CLASS III WHICH IS IN THE CHLOROPLAST
AND CLASS IV WHICH IS IN THE ENDOMEMBRANE. THIS PROTEIN BELON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KDA CLASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NGVLTVTVPKAEVKKPEVKAIEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KGILTVSVAVSE-GKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SLFPEFSELFA-AFPSFAGLRPTF-----DTRLM---RLEDEMKEGRYEVRAELPGVDPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SWISS-PROT entry is copyright. It is produced through
en the Swiss Institute of Bioinformatics and the EN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -EVKVEVEDGNVLVVSGERSREKEDKNDKWHRVERSSGKFVRRFRLPEDAKVEEVKAGLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KDVHIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGADEDDIKATYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NVFDPFADLWADPFDTFRSIVPAISGGSSETAAFANARVDWKETPEAHVFKVDLPGVKKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3 (Rel. 25, Created)
3 (Rel. 25, Last sequ
8 (Rel. 36, Last anno
LASS I HEAT SHOCK PRO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                               low-molecular-weight
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17.8%;
30.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last sequence update)
Last annotation updat
SHOCK PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 130;
Pred. No. 3
  STRUCTURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E0D6DBA3CB30B310 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Asteroideae; Heliantheae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            noved. Usage by and for commercial
(See http://www.isb-sib.ch/announce/
                                                       expressed stress.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       There are no restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .2e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Asteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 151;
                                                                           during
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROTEIN BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Spermatophyta;
                                                                           zygotic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   η
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7;
```

```
Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIR; S18166; S18166.
PIR; S23529; S23529;
INTERPRO; IPRO02068;
--
PEAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
                                                                                                                                                                           genes be
J. Mol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HSP18.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-NOV-1988 (Rel. 09, Created)
01-NOV-1988 (Rel. 09, Last sequence up
01-FEB-1994 (Rel. 28, Last annotation
18.5 KDA CLASS I HEAT SHOCK PROTEIN (F
                                                                                                                                                                                                                        Raschke E., Baumann G., Schoeffl F.; "Nucleotide sequence analysis of soybean sr genes belonging to two different multigene
                                                                                                                                                                                                                                                                                                           STRAIN=CV. CORSOY; MEDLINE=88172502; PubMed=3351943;
                                                                                                                                                                                                                                                                                                                                                                                                   ------youa; viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids I; Fabales; Fabaceae; Papillonoideae; Glycine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Glycine max (Soybean)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P05478;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HS16_SOYBN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; X59701; CAA42222.1; -. EMBL; Z95153; CAB08441.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM the European Bioinformatics Institute. There are no restructed the surpression of the s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Heat shock;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14
                                                                                JEOLIAN JEGONAL HEAT STRUCTURES.
SUBCELLULAR LOCATION: CYTOPLASMIC.
SUBCELLULAR LOCATION: CYTOPLASMIC.
STMILARITY: BELONGS TO THE SMALL HEAT
SIMILARITY: PLANTS HAVE FOUR WHICH ARE CYTOPLASMIC; CLASS AND CLASS IV WHICH IS IN THE TO CLASS I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SUBCELLULAR LOCATION: CYTOPLASMIC.
SIMILARITY: BELONGS TO THE SMALL HEAT SHOCK PROTEIN (HSP20)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SIMILARITY: PLANTS HAVE FOUR CLASSES OF HSP20: CLASS I AND IT WHICH ARE CYTOPLASMIC; CLASS III WHICH IS IN THE CHLOROPLAST AND CLASS IV WHICH IS IN THE ENDOMEMBRANE. THIS PROTEIN BELOWED TO CLASS I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SWISS-PROT entry is copy
een the Swiss Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MVRDGQ-LTIKAER-TEQKDLDG---RSEFAYGSFVRTVSLPVGADEDDIKATYDKGILT 1.22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SLFPEFS-ELFAAFPSFAGLRPTFDTRLM----RLEDEMKEGRYEVRAELPGVDPDKDVIII 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VSV--AVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EVEDGRVLQISGERCREQEEKDDTWHRVERSSGKFIRRFRLPENAKMDEVKAMMENGVLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NIFDPFSLDTWDPFQGIISTEPARETAAIVNARIDWKETPEAHVLKADLPGMKKE-EVKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VVVPKEEEEKKPMVKAIDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Multigene family.
153 AA; 17562 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17.6%;
31.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 129;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DAC8FC46FD253C3C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                        CLASSES OF HSP20: CLASS I AND II III WHICH IS IN THE CHLOROPLAST ENDOMEMBRANE. THIS PROTEIN BELON
                                                                                                                                                                                                                                                        soybean small heat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (HSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18.5).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A
                                                                                                                             SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      57;
                                                                                                                             PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 153;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                      shock
                          PROTEIN BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             restrictions on it
                                                                                                                             (HSP20)
                                                                                                                                                                                                                                                        protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          collaboration - 
L outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      7;
```

```
RESULT
HS11_CH
망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SON BERNELLE SON B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 41
                                                                                                                                                                                                                                                                                                                                                                                                     Knack G., Liu Z., Kloppstech K.;

"Low molecular mass heat-shock proteins o
photoautotrophic cell culture.";
Eur. J. Cell Biol. 59:166-175(1992).
-i- SUBUNIT: FORMS OLIGOMERIC STRUCTURES.
-i- SUBCELLULAR LOCATION: CYTOPLASMIC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-FEB-1994 (Rel.
01-FEB-1994 (Rel.
01-FEB-1994 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                             modified and this statement is not removed. entities requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                     This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermato Magnoliophyta; eudicotyledons; core eudicots; Caryophyllidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Chenopodium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CHERU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=93105971; PubMed=1468438;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Caryophyllales; Chenopodiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HSP18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q05832;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROSITE; PS Heat shock;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; X07160; CAA30154.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .3 KDA CLASS I HEAT
                                                                                                                                                European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                  SIMILARITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     L_CHERU
                                                                                                                                                                                                                                                        ō
                                                                                                                                                                                                                                                                          WHICH ARE CYTOPLASMIC; CLASS III WHICH IS IN THE CHLOROPLAST AND CLASS IV WHICH IS IN THE ENDOMEMBRANE. THIS PROTEIN BELONGS
                                                                                                                                                                                                                                                                                                                             SIMILARITY: PLANTS HAVE FOUR CLASSES OF HSP20: CLASS I AND
                                                                                                                  SWISS-PROT entry is copyright. It is produced through een the Swiss Institute of Bioinformatics and the EMEuropean Bioinformatics Institute. There are no restr by non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQ 73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S00646; S00646
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EVKKPDVKAIEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     E-GKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FPEFSRENSAFVS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VLQISGERNVEKEDKNDTWHRVERSSGKFMRRFRLPENAKVEQVKASMENGVLTVTVPKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVAVS 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PF00011; HSP20; 1.
TE; PS01031; HSP20; 1.
X53870;
                                                                                                                                                                                                                                                     CLASS I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                l Similarity
41; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IPR002068; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; Multigene family.
161 AA; 18503 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     rubrum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
CAA37864.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                  BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28,
28,
28,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (Red
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18503 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      17.4%;
31.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SHOCK PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
                                                                                                                                                                                                                                                                                                                                                                                  TO THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                goosefoot)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cosefoot) (Pigweed).
Embryophyta; Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----TRVDWKETPEAHVFKADIPGLKKE-EVKVQIEDDK 87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 127.5;
Pred. No. 5.8e
24; Mismatches
                                                                                                                                                                                                                                                                                                                                                                             SMALL HEAT SHOCK PROTEIN (HSP20)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19C1D48D6AF2C3D7 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Chenopodium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (HSP 18.3).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .8e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                48;
                                                                                             Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          light-resistant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Spermatophyta;
                                                                                                                                                restrictions
                                                                                                  and
                                                                                                                                                                             EMBL outstation
                                                                                                                                                                                                  a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19;
                                                                                                  for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5
```

```
ALD DEPTH OF THE PROPERTY OF T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HS26_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DR DR DR DR CKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   _YEAST
HS26_YEAST
P15992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PIR; S2080
PIR; S3356
INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gene
                                                                                                                                                                                                                                                                               Saccharomyces cerevisiae chromosome Yeast 10:959-964(1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=89378758; PubMed=2673926;
Bossier P., Fitch I.T., Boucherie H., Tuit
"Structure and expression of a yeast gene
heat-shock protein Hsp26.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "hsp26 of Saccharomyces cerevisiae is related to the superfamily small heat shock proteins but is without a demonstrable function. Cell. Biol. 9:5265-5271(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=90097950; PubMed=2689876; Susek R.E., Lindquist S.L.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Saccharomyces cerevisiae (Baker's yeast)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HSP26 OR YBR072W OR YBR0714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-APR-1990 (Rel. 14, Created)
01-NOV-1990 (Rel. 16, Last sequence update)
01-NOV-1997 (Rel. 35, Last annotation update)
HEAT SHOCK PROTEIN 26 (26 KDA HEAT SHOCK PROTEIN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INTERPRO; IPR002068; -.
PFAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20;
                                                                                                                                                                                                                                                                                                                                                             Steensma H.Y
                                                                                                                                                                                                                                                                                                                                                                                    van
                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=95076715;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Saccharomycetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Heat shock.
                                                                                                                                                                                                                                                                ÷
                                                                                                                                                                                                                                                                                                           'Sequence analysis of a 31 kb DNA fragment 'Sequence analysis of a 51 kb DNA fragment' 'Searcharomyces cerevisiae chromosome II.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               12 SLFPEFS-----ELFAAFPSFAGLRPTFDTRL-----MRLEDEMKEGRYEVRAELPGV 59
                                                                                                                 SUBUNIT: PRESENT IN LARGE COMPLEXES.

DEVELOPMENTAL STAGE: EXPRESSED DURING THE ENTRY INTO PHASE RESULTING FROM GLUCOSE LIMITATION.

INDUCTION: BY HEAT SHOCK, AND UNDER OTHER CONDITIONS SUCH AS INCREASED SALT CONCENTRATION AND STARVATION.
                                                                                                                                                                                                                                                                FUNCTION: NOT KNOWN. ONE OF THE MAJOR
                                                                                                                                                                                                                                                                                                                                                                                 der Aart Q.J.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S20803;
S33566;
                                                                                             SIMILARITY:
                                                                                                                                                                                                                                       HEAT SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GMENGVLTVTVPKNEAPKPQVKAINV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NIFDPFSLDEIWDPFFGLPSTLSTVPRSETAAETAAFANARIDWKETPEAHVFKADLPGV 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        78:323-330(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYDKGILTVSVAVSEG-KPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KKE-EVKVEVEDGNVLRISGQRAREKEEKNDTWHRVERSSGQFMRKFRLPENAKVDQVKA 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DPDKDVHIMVRDGQ-LTIKAERTEQK-----DLDGRSEFAYGSFVRTVSLPVGADEDDIKA 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                          FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Fungi; Ascomycota;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     161 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S20803.
S33566.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                             BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                          PubMed=7985423;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18271 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Saccharomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17.3%;
30.1%;
                                                                                                                                                                                                                                                                                                                                                                                    Barthe
                                                                                             TO
                                                                                             THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23;
                                                                                                                                                                                                                                                                                                                                                                                 C., Doignon F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 126.5;
Pred. No. 7.1e
23; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Saccharomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     D9787AFAD66EADC6
                                                                                             SMALL HEAT SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Tuite M.F.;
gene encoding the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .1e-05;
                                                                                                                                                                                                                                                                POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                       from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 1;
                                                                                                                                                                                                                                                                                                                                                                                 Aigle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Saccharomycetales;
                                                                                             PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CRC64;
                                                                                                                                                                                                                                                                                                                                                                                    3
                                                                                                                                                                                                                                                                                                                                    right
                                                                                                                                                                                                                                                                                                                                                                                    Crouzet
                                                                                                                                                                                                                                                                PRODUCED ON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            small
                                                                                          (HSP20)
                                                                                                                                          OF
                                                                                                                                                                                            STATIONARY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              19;
                                                                                                                                          STRESS
                                                                                                                                                                                                                                                                                                                                                                                    <u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ... O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6,
```

This

SWISS-PROT entry is

Swiss

Institute

copyright. It is produced through a collaboration tute of Bioinformatics and the EMBL outstation -

restrictions

```
HS12_
ID
AC
DT
DT
DT
QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  THE CONTRACTOR OF THE CONTRACT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; M23871; AAA66914.1; -.
EMBL; M26942; AAA79010.1; -.
EMBL; X76294; CAA53929.1; -.
EMBL; Z35941; CAA85016.1; -.
EMBL; S45465; S45465.
PIR; S39222; S39222.
SGD; S0000276; HSP26.
                                                                                                                                                                                                                                                                                                                                                                                                     Nishi R.,
Submitted
                                                                                                                                                         This SWI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HS12_ORYSA STANDARD; PRT; 1
P31673;
01-JUL-1993 (Rel. 26, Created)
01-JUL-1993 (Rel. 26, Last sequence up
01-JUL-1993 (Rel. 26, Last annotation
17.4 KDA CLASS I HEAT SHOCK PROTEIN.
                                             entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           _ORYSA
      EMBL; D12635;
                                                                                            modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Oryza sativa (Rice).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            use by non-profit institutions as long as its content modified and this statement is not removed. Usage by an entitles requires a licence
                                                                      entities
                                                                                                                                   the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Magnoliophyta; Liliopsida;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INIT_MET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  130
                                                                                                                                                                                                                                                                                                        75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                               SIMILARITY: PLANTS HAVE FOUR CLASSES OF HSP20: CLASS I AND II WHICH ARE CYTOPLASMIC; CLASS III WHICH IS IN THE CHLOROPLAST AND CLASS IV WHICH IS IN THE ENDOMEMBRANE. THIS PROTEIN BELON
                                                                                                                                                                                                                             TO CLASS I.
                                                                                                                                                         SWISS-PROT entry is copyright. It is produsen the Swiss Institute of Bioinformatics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LKPQKDGKNHVKKIEVSS 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     --AVSEGKPTEKHIQIRS 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LVSGEIPSTLNEESKDKVKVKESSSGKFKRVITLPDYPGVDADNIKADYANGVLTLTVPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TIKAE-----RTEQKDLDGRSEFAYGSFVRTVSLP--VGADEDDIKATYDKGILTVSV-- 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          shock.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FDNDLSLFPSGFGFPRSVAVPVDILD---HDNNYELKVVVPGVKSKKDIDIEYHQNKNQI 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRD--GQL
                                                                 non-profit institutions as long and this statement is not removed. requires a license agreement (See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            J0276; har.;
; IPR002068; -.
; usp20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PS01031;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    206
213 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             31
      BAA02160.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HSP20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0
31 G
206 S
23748 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17.2%;
29.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Poales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 126; D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         വ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -> A (IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1C9C4B0D0626B6A4 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Poaceae; Oryza
                                                                                                                                                                              It is produced through
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REF.
                                                                                                                              There are no restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ĀĀ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .00011;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 1;
                                                                                                                                                                                                                                                                                                                                   SHOCK PROTEIN (HSP20)
                                                                                                              as its content
                                                                                        Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N N
                                                                                                                                                                                                                                                                                                                                                                                                     databases
                                                                                                                                                         and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                          bу
                                                                                                                                                                                                                                                  PROTEIN BELONGS
                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and for
                                                                                                                                                            EMBL
                                                                                                                 is
                                                                                                                                                            a collaboration - MBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16;
                                                                                          for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ons on its in no way commercial
                                                                                          commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             74
                                                                                                                 no
                                                                                                                                   9
                                                                                                            way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5
```

```
Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DR
DR
DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LARATH
HS12_ARATH
P13853;
Heat shoc
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PIR;
                                                                                               use by non-profit institutions as long modified and this statement is not removed entitles requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                     This
                                                                                                                                                                                                                                                                                                                                                                              Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                        01-JAN-1990 (Rel. 13, Created)
01-JAN-1990 (Rel. 13, Last sequence update)
01-FEB-1994 (Rel. 28, Last annotation update)
17.6 KDA CLASS I HEAT SHOCK PROTEIN (HSP 17.6).
                                    PFAM;
                                                                                                                                                                                                                                                                     Nucleic Acids Res. 17:7995-7995(1989)
-!- SUBCELLULAR LOCATION: CYTOPLASMIC
                                                                                                                                                                                                                                                                                                                               STRAIN=CV. COLUMBIA; TISSUE=LEAF; MEDLINE=90016890; PubMed=2798141;
                                                                                                                                                                                                                                                                                                                                                                                                                               HSP17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INTERPRO; IPR002068; -
PFAM; PF00011; HSP20; '
                        PROSITE;
                                             INTERPRO;
                                                                      EMBL; X16076; CAA34208.1;
                                                                                                                                               the European Bioinformatics Institute.
                                                                                                                                                           between
                                                                                                                                                                                                                                                                                                                     Helm K.W., Vierling E.;
                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                  Arabidopsis thaliana (Mouse-ear cress).
                                                                                                                                                                                                                                                                                                       "An Arabidopsis thaliana cDNA clone encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  139 KEEPKKPDVKSIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
                                                                                                                                                                                                         SIMILARITY: PLANTS HAVE FOUR CLASSES OF HS WHICH ARE CYTOPLASMIC; CLASS III WHICH IS AND CLASS IV WHICH IS IN THE ENDOMEMBRANE.
                                                                                                                                                                                                                                                         SIMILARITY: BELONGS
                                                                                                                                                                                                                                               HAMILY
                                                                                                                                                                                               TO CLASS I.
            shock;
                                                                                                                                                          SWISS-PROT entry is copyright. It is produced through een the Swiss Institute of Bioinformatics and the EM
                                                            S06074; S06074
                                                                                                                                                                                                                                                                                              shock
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VSE-GKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JS0710; JS0710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GNVLQISGERIKEQEEKTDKWHRVERSSGKFLRRFRLPEDTKPEQIKASMENGVLTVTVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GQ-LTIKAER----TEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVA 126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLFPRANSDAAA---FAG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRD
                        PF00011; HSP20; 1.
TE; PS01031; HSP20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                IPR002068;
                                                                                                                                                                                                                                                                                             protein."
 156
            Multigene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
ne family.
17547 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          17.0%;
33.6%;
                                                                                                                                                                                                                                                         TO
                                                                        ALT_SEQ
                                                                                                                                                                                                                                                                      CYTOPLASMIC
                                                                                                                                                                                                                                                         THE SMALL HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRT;
 57BA4B7F1BD637DC CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B6A3C4C768598012 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -ARIDWKETPEAHVFKADVPGLKKE-EVKVEVED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           124.5; DB
No. 0.0001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      156
                                                                                                           noved. Usage by and for commercial
(See http://www.isb-sib.ch/announce/
                                                                                                                                               There are no restrictions on
                                                                                                                                                                                                                                  OF HSP20: CLASS I AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA
                                                                                                                                                                                                                                                         SHOCK PROTEIN (HSP20)
                                                                                                                                   as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB 1;
                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               50;
                                                                                                                                   its content
                                                                                                                                                                                                          IN THE
                                                                                                                                                                                                                                                                                                         low
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                         molecular weight
                                                                                                                                                                                                           PROTEIN
                                                                                                                                                                                                                       CHLOROPLAST
                                                                                                                                                           EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         154;
                                                                                                                                                                        D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               19;
                                                                                                                                                                                                           BELONGS
                                                                                                                                                           collaboration -
                                                                                                                                   i.n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6,
```

Query Match Best Local Similarity

17 . 2%;

Score Pred.

124; DB 1; No. 0.00012;

Length 156;

١

```
Q
                                                        рь
                                                                                                                                                                                                                                                                                                                                                    Д
                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 13
HS11_ARATH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                Query Match
Best Local S
Matches 34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                            PROSITE; PS01031; nore...
Heat shock; Multigene family.
FRONTENCE 156 AA; 17454 MW;
                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EN the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-NOV-1990 (Rel. 16, Created)
01-NOV-1990 (Rel. 16, Last seq
01-FEB-1994 (Rel. 28, Last ann
17.4 KDA CLASS I HEAT SHOCK PR
                                                                                                                                                                                                                EMBL; X17293; CAA35182.1; -
PIR; JQ0351; JQ0351.
INTERPRO; IPR002068; -
PFAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 - No1 .
                                                                                                                                                                                                                                                                                                       entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheo
Magnoliophyta; eudicotyledons; core eudicots;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HS11_ARATH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Arabidopsis thaliana."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Takahashi T., Komeda Y.; "Characterization of two genes encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=90158498; PubMed=2482931;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN-CV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HSP17.4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                01-NOV-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P19036;
 122
                            108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  118
                                                        63
                                                                                     53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                . Gen. Genet. 219:365-372(1989).
SUBCELLULAR LOCATION: CYTOPLASMIC.
SIMILARITY: BELONGS TO THE SMALL !
                                                                                                                                                                                                                                                                                                                                                                                                                             TO
                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY: PLANTS HAVE FOUR CLASSES OF HSP20: CLASS I AND II WHICH ARE CYTOPLASMIC; CLASS III WHICH IS IN THE CHLOROPLAST AND CLASS IV WHICH IS IN THE ENDOMEMBRANE. THIS PROTEIN BELONGS
KVEEVKASMENGVLSVTVPKVQESKPEVKSIDI
                           DEDDIKATYDKGILTVSV-AVSEGKPTEKHIQI
                                                                                  RAELPGVDPDKDVHIMVRDGQ-LTIKAERT----EQKDLDGRSEFAYGSFVRTVSLPVGA 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NGVLSVTVPKVPEKKPEVKSIDI 155
                                                         KADVPGLKKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KGILTVSV-AVSEGKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -EVKVEVEDGNILQISGERSNENEEKNDKWHRVERSSGKFTRRFRLPENAKMEEIKASME 132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KDVHIMVRDGQ-LTIKAERT----EQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NVFDPFSLDVFDPFEGFLTPSGLANAPAMDVAAFTNAKVDWRETPEAHVFKADLPGLRKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SLFPEFS-ELFAAFPSF---AGL--RPTFDTRLM---RLEDEMKEGRYEVRAELPGVDPD
                                                                                                                                                                                                                                                                                                                                                                                                                             CLASS I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   46;
                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COLUMBIA;
                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                      -EVKVEVEDGNILQISGERSSENEEKSDTWHRVERSSGKFMRRFRLPENA
                                                                                                                              16.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Last sequence update)
Last annotation update)
SHOCK PROTEIN (HSP 17.4
                                                                                                                  19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  139
                                                                                                                              Score 123.5; DB 1 Pred. No. 0.00013;
                                                                                                                                                                                          F6FEA76EBAA29501 CRC64;
                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HEAT SHOCK PROTEIN (HSP20)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               156
                           139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Tracheophyta; Spermatophy dicots; Rosidae; eurosids
154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        small heat-shock proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17.4).
                                                                                                               33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 56;
                                                                                                                                            1.
                                                                                                                                            Length 156;
                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Spermatophyta; e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                   restrictions on
                                                                                                                                                                                                                                                                                                                                      and
                                                                                                                                                                                                                                                                                                                                                                               EMBL outstation
                                                                                                                                                                                                                                                                                                                                                    18
                                                                                                                                                                                                                                                                                                                                                                                           a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16;
                                                                                                               7;
                                                                                                                                                                                                                                                                                                                                       for
                                                                                                                                                                                                                                                                                                                                                     n
                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                      commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       73
                                                                                                                                                                                                                                                                                                                                                     no
                                                                                                               4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
```

```
RESULT 14
HS13_ARATH
HS13_ARATH
ID HS13_A
C P19037
DT 01-NOV
DT 01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-NOV-1990 (Rel. 16, C
01-NOV-1990 (Rel. 16, L
01-FEB-1994 (Rel. 28, La
18.2 KDA CLACC T ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Takahashi T., Yoshibumi K.;
"Characterization of two genes encoding small heat-shock proteins "Characterization of two genes encoding small heat-shock proteins are included by the control of the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encoding small heat-shock proteins are included by the control of two genes encodi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Arabidopsis thaliana (Mouse-ear cress). Tracheophyta; Spermatophy Eukaryota; Viridiplantae; Embaryophyta; Tracheophyta; edicottyledons; core eudicots; Rosidae; eurosids Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P19037;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HS13_ARATH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-CV. COLUMBIA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=90158498; PubMed=2482931;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIMILARITY: PLANTS HAVE FOUR CLASSES OF HSP20: CLASS I AND WHICH ARE CYTOPLASMIC; CLASS III WHICH IS IN THE CHLOROPLAS AND CLASS IV WHICH IS IN THE ENDOMEMBRANE. THIS PROTEIN BEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               . Gen. Genet. 219:365-372(1989).
SUBCELLULAR LOCATION: CYTOPLASMIC.
SIMILARITY: BELONGS TO THE SMALL !
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TO CLASS I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SWISS-PROT entry is copyright. It is produced through a collaboration. en the Swiss Institute of Bioinformatics and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HEAT SHOCK PROTEIN (HSP 18.2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Tracheophyta; Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                There are no restrictions ong as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SHOCK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CHLOROPLAST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (HSP20)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              n no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in
```

PFAM; PF00011; HSP20; 1. PROSITE; PS01031; HSP20; 1. Heat shock; Multigene family. SEQUENCE 161 AA; 18134 MW; entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch). EMBL; x17295; CAA35183.1; NTERPRO; JQ0352; JQ0352. RPRO; IPR002068; -. BB4CA1946FBE6F6D CRC64;

QУ Matches Query Match Best Local : 1 Similarity 37; Conserv Conservative 16.9%; 14; Score 123.5; DB 1; Pred. No. 0.00013; Mismatches 39; Length 161; Indels 7; Gape

Qy Вb 108 DEDDIKATYDKGILTVSV-AVSEGKPTEKHIQIRSTN 66 <u>υ</u> RAELPGVDPDKDVHIMVRD-GQLTIKAERT----EQKDLDGRSEFAYGSFVRTVSLPVGA 107 KADLPGLKKE-EVKVEVEDKNVLQISGERSKENEEKNDKWHRVERASGKFMRRFRLPENA 124

DЪ

```
RESULT
HS11_OF
                                                                               SULT 15
11_ORYSA STANDARD; PRT; 15(
P27777; 92 (Rel. 23, Created)
01-AUG-1992 (Rel. 23, Last sequence update)
01-OCT-1996 (Rel. 34, Last annotation update)
16.9 KDA CLASS I HEAT SHOCK PROTEIN.
SEQUENCE FROM
                                                 Oryza sativa (Rice).
Eukaryota; Viridiplantae;
                                 Magnoliophyta; Liliopsida;
                                                                                                                                                                                                                                                                   125
                                                                                                                                                                                                                                                                 KMEEVKATMENGVLTVVVPKAPEKKPQVKSIDISGAN
                                 Embryophyta; Tracheophyta;
; Poales; Poaceae; Oryza.
                                                                                                                       update)
                                                                                                                                                                           150
                                                                                                     update)
                                                                                                                                                                           AΑ
                                                                                                                                                                                                                                                                 161
                                                 Spermatophyta;
```

```
CCC CCC RTT RA RT RT RAX
                                                                                                                   δÃ
                                                                                                                                                        Query Match
Best Local Similarity 37.6
Matches 35; Conservative
                                                                                                                                                                                                                                                                                                                   EMBL; X60820; CAA43210.1; -.
EMBL; M80938; AAA33910.1; -.
EMBL; M80939; AAA33910.1; -.
PIR; S20874; S20874.
INTERPRO; IPR002068; -.
PFAM; PF00011; HSP20; 1.
PROSITE; PS01031; HSP20; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation—the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
Tzeng S., Yeh K.W., Chen Y.M., Lin C.Y.;
"Two Oryza sativa genomic DNA clones for 16.9-kilodalton heat shock
proteins.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-CV TAINONG;
MEDLINE-92256816; PubMed-1581572;
MEDLINE-92256816; PubMed-1581572;
Tseng T.S., Yeh K.W., Yeh C.H., Chang F.C., Chen Y.M., Lin C.Y.;
Tseng T.S., Yeh K.W., Yeh C.H., Chang F.C., Chen Y.M., Lin C.Y.;
Two rice (Oryza sativa) full-length cDNA clones encoding
Tow-molecular-weight heat-shock proteins.";
Plant Mol. Biol. 18:963-965(1992).
                                                                                                                                                                                                                                                     Heat shock; Multigene family.
VARIANT 124 124 L -> M.
SEQUENCE 150 AA; 16939 MW; 29003D5C5E2ABD95 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      +
108 DEDDIKATYDKGILTVSVAVSE-GKPTEKHIQI 139
| :|| : |:|||:| :| || || ||:|
116 KVDQVKAGLENGVLTVTVPKAEVKKPEVKAIEI 148
                                                                              57
                                                                                                                   53 RAELPGVDPDKDVHIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGA 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIMILARITY: PLANTS HAVE FOUR CLASSES OF HSP20: CLASS I AND II WHICH ARE CYTOPLASMIC; CLASS III WHICH IS IN THE CHLOROPLAST AND CLASS IV WHICH IS IN THE ENDOMEMBRANE. THIS PROTEIN BELONGS TO CLASS I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FAMILY
                                                                              KADLPGVKKE-EVKVEVEEGNVLVISGQRSKEKEDKNDKWHRVERSSGQFMRRFRLPENA 115
                                                                                                                                                                               16.6%; Score 121.5; DB 1; 37.6%; Pred. No. 0.00019;
                                                                                                                                                            18; Mismatches
                                                                                                                                                            33;
                                                                                                                                                                                                 Length 150;
                                                                                                                                                            Indels
                                                                                                                                                            Gaps
```

Search completed: January 5, 2001, 14:31:21 Job time: 352 sec

۲

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 st
                                                                                                                                                                                                                                                                                                                                                             Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                           Title:
Perfect score:
                                                                                                                                                                                                                             Result
                                                                                                                                                                                                                                                                                                                                                                                                                       Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Run on:
                                                                                                                                                                                                                                                                                                                                                                                    tal number of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein -
                                                                                                                                                                                                                        ŏ
 Pred. No. is the r
score greater than
and is derived by
                                                                                                                                148.5
147
140.5
138.5
137.5
137.5
136.5
 131
130.5
130
130
129
129
127.5
127.5
127.5
                                                                              133
131.5
131.5
                                                                                                                                                                                                                       Score
                                                                                                                                                                                   718
165.5
154.5
149
                                                                                                                                                                                                                                                                                                                                                             seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein search, using
                                                                                                                                                                                                                                                                                                                                                             length:
length:
                                                                                                                                                                                                                      Query
Match
                                                                                                                                                                                                                                                         is the number of results predicted by chance to have a ater than or equal to the score of the result being printed, rived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                   hits satisfying chosen parameters:
 98.2
22.6
                                                                                                                                                                                                                                                                                                                                                                                                               Gapop
                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-461-774-8
731
                                                                                                                                                                                                                                                                                                                    PIR_66:*
                                                                                                                                                                                                                                                                                                                                                                                                195891 seqs, 67900655 residues
                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                January 5, 2001, 14:28:41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTLPVQRHPRSLFPEFSEL.....
                                                                                                                                                                                                                                                                                      pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                             0
20000000000
                                                                                                                                                                                                                                                                                                                                                                                                                10.0 , Gapext 0.5
DB
CYPZ79
HHWT17
S58210
S23212
S23529
S71566
S71566
S24396
T144801
S00646
                                                                              A75436
S72545
T05740
T04171
                                                                                                                                               B69496
T05739
T46658
S04939
                                                                                                                                                                            F70942
G70939
T40376
S74956
A49942
                                                                                                           D72385
S21600
                                                                                                                          S72546
F82582
                                                                                                                                                                                                                       IJ
                                                                        T09611
                                                                                                                                        S72544
                                                                                                                                                                                                                                                                                                                                 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WS
                                                                                                                                                                                                                                            SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              model
                                                                                                                                                                                                                                                                                                                                                                                                                                     ....SVAVSEGKPTEKHIQIRSTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Search time 67.42 Seconds (without alignments)
144.019 Million cell updates/sec
                                           bradyzoite-
heat shock
                                                                              heat shock
                                                                                                                                                                  spore protein sp21
heat shock protein
small heat shock p
              heat
                                                                                                                                                     probable heat shoc
small heat shock p
                                                                                                                                                                                                                       Description
                                                                                                                                heat shock
                                                                                                                                                                                                        probable hspx prot
                      heat shock
                             heat shock
                                   heat shock
                                                          heat shock
                                                                 heat shock
                                                                       heat shock
                                                                                             heat shock
                                                                                                    heat shock
                                                                                                           heat shock
                                                                                                                  heat shock
                                                                                                                          Mot
                                                                                                                                                                                         heat shock
                                                                                                                                                                                                 probable hsp prote
                                                                                                                                               neat shock
                                                                                                                         molecular weig
              shock
                            c protein
c protein
c protein
                                                 -specifi
                                                               protein
                                                                              protein
protein
protein
protein
                                                                                            protein
                                                                                                    protein
                                                                                                           protein
                                                                                                                  protein
                                                                                                                                       protein
                                                                                                                                               22K pro
                                                                                                                                                                                         protein
              protein
                      protein
                                                                                                                                 protein
```

160 2 7064377 155 2 706449 161 2 533566 214 2 545465 1159 2 704173 1157 2 506074 1156 2 700351 1156 2 749264 1159 2 749267 1159 2 749267 1159 2 749267 1159 2 749267 1159 2 749267	45		43													
2 T06449 2 T06449 2 S33566 2 S45465 2 T04173 2 T04173 2 T04173 2 S06074 2 JQ0351 2 T49664 2 S20874 3 T49834 3 T46833	19.5	120	121	121	21.5	.22.5	22.5	23.5	.23.5	124	24.5	24.5	126	26.5	26.5	127
JC4377 T064449 S33566 S45465 J00710 J00710 T04173 S06074 J00351 J00352 T49264 S71567 S71567 F749264 A57270 F703958	16.3	16.4	16.6	16.6	16.6	16.8	16.8	16.9	16.9	17.0	17.0	17.0	17.2	17.3	17.3	17.4
T06449 S33566 S45465 J09710 T04173 306074 J00351 J00352 T49264 S71567 T49264 F749264 F749264 F749264 F749264 F749264	235	159	159	143	150	163	156	161	156	157	159	154	214	161	155	160
	2	Ν	2	N	N	N	ν	2	N	N	Ν	2	2		2	2
low-molec probable heat shoc	T06324	T46833	T03958	A57270	S20874	S71567	T49264	JQ0352	JQ0351	S06074	T04173	JS0710	S45465	S33566	T06449	JC4377
ullar weig heat shock k protein	heat shock	shoc	shoc	shoc	shoc	hea	shoc	shoc	heat shock	heat shock	heat shock	heat shoc	heat shoch	heat shock	probable heat show	low-molecular-weig

ALIGNMENTS

```
A;Cross-references: GB:S79751; NID:g244561; PIDN:AAB21317.1; PID:g244562
A;Note: sequence extracted from NCBI backbone (NCBIN:79751, NCBIP:79752)
R;Lee, B.Y.; Hefta, S.A.; Brennan, P.J.
Infect. Immun. 60, 2066-2074, 1992
A;Title: Characterization of the major membrane protein of virulent Mycobacterium tub A;Reference number: A43823; MUID:92225631
A;Accession: A43823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      probable hspX protein - Mycobacterium tuberculosis (strain H37RV)
N;Alternate names: 14K antigen; 19K major membrane protein
C;Species: Mycobacterium tuberculosis
C;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000
C;Accession: F70942; A42651; A43823
                                                                                                                                                                                                                                                                                          A;Gene: hspX
C;Superfamily: alpha-crystallin
C;Keywords: membrane protein; surface antigen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Experimental source: strain H37Rv R;Verbon, A.; Hartskeerl, R.A.; Schuitema, A.; Kolk, A.H.; Young, J. Bacteriol. 174, 1352-1359, 1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S. Nature 393, 537-544, 1998
A;Authors: Squares, S.; Sulston, J.E.; Taylor, K.; Whitehead, S.; Barrell, B.G. A;Title: Deciphering the biology of Mycobacterium tuberculosis from the complete geno A;Reference number: A70500; MUID:98295987
A;Accession: F70942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, D.; Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N.; Ht.; Connor, R.; Rogers, J.; Rutter, S.; Seeger, K.; Skelton, S.; Squares, S.; Station, S.; Squares, Squares, S.; Squares, Square
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             J. Bacteriol. 174, 1352-1359, 1992
A;Title: The 14,000-molecular-weight antigen of Mycobacterium tuberculosis is related
A;Reference number: A42651; MUID:92138631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: DNA
A; Residues: 1-144 <COL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: protein A; Residues: 2-144 <LEE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-144 <VER>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Reference number: A42651; A; Accession: A42651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Status: preliminary; nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               F70942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Experimental source:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Status: preliminary
      Best Loc
Matches
                                                                                                                    Query Match
      Local Similarity 98. nes 141; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                strain Erdman
                                                       98.2%;
Score 718; DB 2
Pred. No. 2e-58;
0; Mismatches
                                                                                                                          2;
                                                                                                              Length 144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIDN:CAA17245.1; PID:g289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    D.B.; Lathigra, R.
Gaps
      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Holroyd,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gordon
```

g Qy

2

1 ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD 60

ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD 61

```
A; Residues: 1-143 <LEN>
A; Cross references: EMBL: AJ003817; PIDN: CAA06031.1
A; Experimental source: strain 972 h(-)
R; Danjoh, I; Fujiyama, A.
Gene 236, 347-352, 1999
                                                                                                                                                                                                                                                                                                                                                                                           t shock protein 16 - fission yeast (Schizosaccharomyces pombe)
Species: Schizosaccharomyces pombe
C;Date: 03.Dec-1999 #sequence_revision 03-Dec-1999 #text_change 21-Jul-2000
C;Accession: T40376; T43371; T43377
R;Lyne, M.; Wood, V.; Rajandream, M.A.; Barrell, B.G.; Brown, D.; Churcher, submitted to the EMBL Data Library, May 1998
A;Accession: T40376
                                                                                                                                                                                                                            A;Cross-references: EMBL:AL023534; PIDN:CAA19006.1; GSPDB:GN00067; A;Experimental source: strain 972h-; cosmid c3E7 R;Lenaers, G.; Perret, E.; Dumont, X.; Picard, A.; Caput, D. submitted to the EMBL Data Library, October 1997
                                                                                                                                                            A; Reference number: Z22458
A; Accession: T43371
                                                                                                                                                                                                                                                                                                                         A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 1-143 <LYN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Residues: 1-159 <COL>
A;Cross-references: GB:AL021929; GB:AL123456; NID:g3242291; A;Experimental source: strain H37Rv C;Genetics: A;Gene: hsp C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                           A; Description: Hspl6, a major fission yeast
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rajandream, M.A.; Rogers, J.; Rutter, S.; Seeger, Nature 393, 537-544, 1998

Nuthors: Sqares, R.; Sulston, J.E.; Taylor, K.; Itle: Deciphering the biology of Mycobacterium Trkeference number: A70500; MUID:98295987

A;Accession: G70939
                                                                                                                A; Molecule type: mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R;Cole, S.T.; Brosch, R.; Parkhill, J.; Garnier, T.; Churcher, C.; Harris, Connor, R.; Davies, R.; Devlin, K.; Feltwell, T.; Gentles, S.; Hamlin, N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Species: Mycobacterium tuperculusis
;Date: 17-Jul-1998 #sequence_revision 17-Jul-1998 #text_change 20-Jun-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Accession: G70939
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Status: preliminary; nucleic acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              101 VSLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQ 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        116 FRLPAHVTSEAIAASYDAGVLTVRVAGAYKAPAETQAQ 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VRAELPGVDPDKDVHIMVRDGQ----LTIKAERTEQK-----DLDGRS--EFAYGSFVRT 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VRLELPGIDVDKDVNVELDPGQPVSRLVIRGEHRDEHTQDAGDKDGRTLREIRYGSFRRS 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LTVSVAVSEGKPTEKHIQIRSTN 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           41.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 165.5; DE 
Pred. No. 4e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                         heat shock protein homologous to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Whitehead, S.; Barrell, B.G. tuberculosis from the complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        K.; Skelton, S.; Squares, S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ω
..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PIDN:CAA17343.1; PID:g29094
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                159;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11;
                                                                                                                                                                                                                                                                                                       SPDB:SPBC3E7.02c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N . .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             D.; Gordon,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C.M
                                                                                                                                                                                                           the buddin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   w
••
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ທີ່
```

RESULT

heat shock

protein

SP21 -

Stigmatella

aurantiaca

```
В
                              δÃ
                                                                  B
                                                                                                  Ş
                                                                                                                                                                                                                        C;Genetics:
A;Gene: hspA
C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                                                                                             K; Kaneko, T.; Sato, S.; Kotani, H.; Tanaka, A.; Asamizu, O, K.; Okumura, S.; Shimpo, S.; Takeuchi, C.; Wada, T.; IDNA Res. 3, 109-136, 1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C;Species: Synechocystis sp.
A;Variety: PCC 6803
C;Date: 25-Apr-1997 #sequence_revision 25-Apr-1997 #text_change 20-Jun-2000
C;Accession: S74956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT
S74956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Note: probably regulated by a C; Superfamily: alpha-crystallin C; Keywords: molecular chaperone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Title: Ras-mediated signaling pathway regulates the expression of a A;Reference number: Z22465; MUID:99384015
A;Accession: T43377
A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 1-143 <DAN>
                                                                                                                                                                                                                                                                          A; Cross-references: EMBL:D90902;
A; Note: the nucleotide sequence
                                                                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-146 <KAN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Gene: hsp16;
A; Map position:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        spore protein sp21 - Synechocystis
N;Alternate names: protein sl11514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Cross-references: EMBL:AB012619; C;Genetics:
                                                                                                                                                                                                                                                                                                                                              A; Status: nucleic acid sequence not shown;
                                                                                                                                                                                                                                                                                                                                                                A; Accession:
                                                                                                                                                                                                                                                                                                                                                                                                                  A; Title: Sequence analysis of the genome of
                                                                                                                                                                                                                                                                                                                                                                              A; Reference number: S74322; MUID: 97061201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
Matches 46; Conser
                                                                                                                                         Matches
                                                                                                                                                        Query Match
Best Local
108
                                 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              118
                                                                  49
                                                                                                     47
                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15
                                LPVGADEDDIKATYDKGILTVSV-AVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NGLLTVTLPKVEKSQTKKQIAIK 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KGILTVSVAVSEGKPTEKHIQIR 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DVHIMVRDGQLT,IKAE-----RTEQKDLDGR-SEFAYGSFVRTVSLPVGADEDDIKATYD 117
VPGAIQNTEVKANYDAGILTLTLPKVEEAKNKVVKVQL
                                                                  EEAYVLKLELPGMDPD-NLDIQAARDAVTVSGDRQDTHSTEKDGVRRTEFRYGSFRRVIP 107
                                                                                                    EGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAER--TEQKDLDG--RSEFAYGSFVRTVS 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DVQVHYDSGKLTISGEVVNERKNESTEGNQRWSERRFGSFSRTITIPAKIDADRIEANFS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PTVNDLFSDFVSYSPRLNNQIPGELSPSID------VHEGKDTVSVDVELPGVKKE- 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PEFSELFAAFPSFA-----GLRPTFDTRLMRLEDEMKEGR--YEVRAELPGVDPDK 63
                                                                                                                                       36;
                                                                                                                                                                                                                                                                                                                                                                  S74956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SPBC3E7.02c
                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                      20.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   21.1%;
                                                                                                                                       19;
                                                                                                                                                                                                                                                                            Was submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ras-mediated
                                                                                                                                  Score 149; DB 2; I
Pred. No. 1.1e-06;
o. Mismatches 37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 154.5; DB 2
Pred. No. 3.5e-07;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       sp.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NID: g3298469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (strain
                                                                                                                                                                                                                                                                                                                                              translation not
                                                                                                                                                                                                                                                                                                                                                                                                                  the unicellular cyanobacterium Synechocys
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      signaling
                                                                                                                                                                                                                                                                            NID:g1652027; PII
to the EMBL Data
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PCC
145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PIDN:BAA31521.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2
                                                                                                                                                                      Length 146
                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pathway,
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Watanabe, A.;
                                                                                                                                                                                                                                                                          PIDN:BAA16996.1;
ata Library, June
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       but
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27;
                                                                                                                                      6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PID: 93298470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       not by
                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Yamada,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                low-molecular-w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Miyajima,
da, M.; Yas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         t he
                                                                                                                                                                                                                                                                              PID:g165
                                                                                                                                      4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       heat-s
```

Ÿ

```
R:Klenk, H.P.; Clayton, R.A.; Tomb, J.F.; White, O.; Nelson, K.E.; Ketchum, K.A.; Dodson, Fleischmann, R.D.; Quackenbush, J.; Lee, N.H.; Sutton, G.G.; Gill, S.; Kirkness, E.F. Glodek, A.; Zhou, L.; Overbeek, R.; Gocayne, J.D.; Weidman, J.F.; McDonald, L. Nature 390, 364-370, 1997

A:Authors: Utterback, T.; Cotton, M.D.; Spriggs, T.; Artiach, P.; Kaine, B.P.; Sykes, S. Smith, H.O.; Woese, C.R.; Venter, J.C.
Title: The complete genome sequence of the hyperthermophilic, sulfate-reducing archaec Reference number: A69250; MUID:98049343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N,Alternate names: spore protein (;Species: Stigmatchla aurantiaca (;Species: Stigmatchla aurantiaca (;Species: I-Nov-1994 #sequence_revision 11-Nov-1994 #text_change 13-Aug-1999 (;Accession: A49942; S27669 R;Heidelbach, M.; Skladny, H.; Schairer, H.U. J. Bacteriol. 175, 7479-7482, 1993 A;Title: Heat shock and development induce synthesis of a low-molecular-weigh; Reference number: A49942; MUID:94042926 A;Accession: A49942
                                                                       Ş
                                                                                                                        В
                                                                                                                                                               Οy
                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  small heat shock protein (hsp20-2) homolog - Archaeoglobus fulgidus
C;Species: Archaeoglobus fulgidus
C;Date: 05-Dec-1997 #sequence_revision 05-Dec-1997 #text_change 13-Aug-1999
C;Accession: B69496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                             망
                                                                                                                                                                                                                                                                                                                                                                                                                              A;Cross-references: GB:AE000967; GB:AE000782; C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: DNA
A; Residues: 1-140 <KLE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Gene: hspA
C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-188 <HEI>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Status: preliminary; nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Cross-references: GB:M94510; NID:g152657; PIDN:AAA16136.1; PID:g152658
                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
Matches 45; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      117 DKGILTVSV------AVSEGKPTEKHIQ 138
                             124
                                                                         123 VSVAVSEGKPTEKHIQI 139
                                                                                                                                                                      67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14 FPEFSEL------FAAFPSFAGLR------PTFDTRLMRLEDEMKEGRYEVRAELPGVD 60
                                                                                                                                                                                                                12 RRMQERFNRLLEEFGRFPEVKEFRVTMPV-----DVIDEGEQIRVVADLPGFSKE-DLE 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAY----GSFVRTVSLPVGADEDDIKATY 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -EKDIEVTLTGDRVSVSGKREREKREESERFYAYERTFGSFSRAFTLPEGVDGDNVRADL 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FQQMQELMNWDPFELANHPWFANRQGPPAFVPAFEVR-----ETKEA-YIFKADLPGVD
                                                                                                                                                                                                                                              RHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEG-RYEVRAELPGVDPDKDVH
                                                                                                                                                IMVRDGQLTIKAERTEQ-KDLDG---RSEFAYGSFVRTVSLPVGADEDDIKATYDKGILT 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KNGVLTLTLPKRPEVQPKRIQVASSGTEQKEHIK 168
                             -EITIPKLKKDRKAVQI
                                                                                                                        IYFEDGDLVIKAEKKEEFEEKKGEYLRRERRMGKVYRRIALPAGLDIDAVKAKYNNGVL-
                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                   20.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20.3%;
                                                                                                                                                                                                                                                                                                             19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             28;
                                                                                                                                                                                                                                                                                                           Score 147; DB 2;
Pred. No. 1.6e-06;
19; Mismatches 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 148.5; DB 2
Pred. No. 1.7e-06;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                       NID: g2689290; PIDN: AAB89284.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 2;
                                                                                                                                                                                                                                                                                                                59,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           46;
                                                                                                                                                                                                                                                                                                                                                       Length 140
                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 188;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               low-molecular-weight stress-re
                                                                                                                                                                                                                                                                                                             14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                75
                                                                                                                                                                                                                                                                                                                                                                                                                                                       PID: 926485
                                                                                                                                                                                                                                                                                                             6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7;
Ωy
```

```
망
                                                                                                                                                                                                                                                                                                                                                                                 R;Michelini, E.T.; Flynn, G.C. submitted to the EMBL Data Library, November 1998 A;Description: The unique chaperone operon of Thermotoga A;Reference number: 223119 A;Accession: T46658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 small heat shock protein [validated] - Thermotoga maritima (DSM 3109) C;Species: Thermotoga maritima (C;Species: DSM 3109) A;Variety: DSM 3109 C;Date: 18-Feb-2000 #sequence_revision 18-Feb-2000 #text_change 28-Jul-2000 C;Accession: T46658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     T46658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               probable heat shock protein 17 - barley
C;Species: Hordeum vulgare (barley)
C;Date: 09-Apr-1999 #sequence_revision 09-Apr-1999 #text_change 13-Aug-1999
                                                                                                                                                                               A;Description: molecular chaperone [validated; MUID:99328968] C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                               A;MoLecule type: DNA
A;Residues: 1-142 <MIC>
A;Cross-references: EMBL:AF106330;
A;Experimental source: DSM 3109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C; Superfamily: alpha-crystallin
C; Keywords: heat shock; stress-induced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Title: Identification, characterization and analysis A;Reference number: Z15446; MUID:94156165 A;Accession: T05739
                                                                                                                                                                                                                      C; Function:
                                                                                                                                                                                                                                                                                                                                                              A; Status: preliminary; translated from GB/EMBL/DDB.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Cross-references: EM
A; Experimental source:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Genome 36,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R; Marmiroli, N.; Pavesi, A.; di Cola, G.; Hartings, H.; Raho, G.; Conte, M.R.; Perrot
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C; Accession: T05739
                                                                                                                                                                                                                                         A; Gene: shsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A:Gene: hsp17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Residues: 1-151 <MAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             108 DEDDIKATYDKGILTVSVAVSE-GKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           53
    16
                                       σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 MSIVRRSNVLDP-FADLWADPLDTFRSIFPAISGGNSETAVRERRM--DWKGRRLEAHVF 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4 LPVQRHPRSLFPEFSELFA-----AFPSFAGLRPTFDTRLMRLEDEMKEGRYEV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |::|| : |:|||:| :| || | |:| 149
                                       VQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDV 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RAELPGVDPDKDVHIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGA 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1111-1118, 1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              51;
                                                                               l Similarity
41; Conserv
                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL:X64560;
ce: cv. Onice
                                                                      18.9%; Suc
/ 29.7%; Pre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            19.2%;
----TEVRPAPDMDVFETDDEV-----VIEVEIPGID-RKDV 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 140.5;
pred. No. 7.1e
24; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NID:g509175; PIDN:CAA45861.1; PID:g509176
                                                                             Score 138.5; DB 2;
Pred. No. 9.9e-06;
5; Mismatches 53;
                                                                                                                                                                                                                                                                                                      PIDN: AAC79726.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1.1e-06;
nes 57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 2;
                                                                                                                    DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         of cDNA and
                                                                               Indels
                                                                                                                    Length 142;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 151;
                                                                                                                                                                                                                                                                                                                                                                                                                          maritima: cloning
                                                                               19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      genomic sequences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      52
                                                                                                                                                                                                                                                                                                                                                                                                                          and initia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8;
                                                                               5
```

66

HIMVRDGQLTIKAERTEQKDLDGRS----EFAYGSFVRTVSLPVGADEDDIKATYDKGIL 12:

```
A; Nolecule type: mRNA
A; Residues: 1-159 <CAV>
A; Residues: 1-159 <CAV>
A; Residues: 1-159 <CAV>
A; Ross-references: EMBL: X94193; NID:g1122316; PIDN:CAA63903.1; PID:g1122317
A; Note: the nucleotide sequence was submitted to the EMBL Data Library, December 1995
A: Note: the source is designated as Pennisetum glaucum
                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                             A; Note: the source is designated C; Genetics:
A; Gene: hsp17.9
C; Superfamily: alpha-crystallin C; Keywords: heat shock; stress-i
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               heat shock protein 17.9 - pearl millet C;Species: Pennisetum americanum (pearl millet) C;Date: 01-May-1998 #sequence_revision 01-May-1998 #text_change 20-Jun-2000 C;Accession: S72544
R;Cavan, G.P.; Skoet, K.; Stevens, M.J.; Howarth, C.J.
Plant Mol. Biol. 30, 1075b, 1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    heat shock 22K protein - Chlamydomonas reinhardtii
C;Species: Chlamydomonas reinhardtii
C;Species: Chlamydomonas reinhardtii
C;Date: 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change 13-Aug-1999
C;Accession: S04939
R;Grimm, B.; Ish-Shalom, D.; Even, D.; Glaczinski, H.; Ottersbach, P.; Ohad, I.; Kl
Eur. J. Biochem. 182, 539-546, 1989
A;Title: The nuclear-coded chloroplast 22-kDa heat-shock protein of Chlamydomonas.
A;Reference number: S04939; MUID:89325298
A;Accession: S04939
           Ş
                                                        Ş
                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Status: nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S72544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C; Keywords: chloroplast
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cross-references: EMBL:X15053; NID:g18151; PIDN:CAA33152.1; PID:g18152
Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Reference number: S72544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           fitle: Sequence announcement.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    olecule type: mRNA
esidues: 1-157 <GRI>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   104 PVGADEDDIKATYDKGILTVSVAVSE--GKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              122 TIRVPKKEER-KKKVIEV 138
     84
                                                                72
                                                                                                                      34
                                                                                                                                                                           12
                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QITVEENILKISGEKKLEREQKGKNYYYVERSAGKFERAIRLPDYVDVEKIKAEYKNGVL 121
        GNVLQISGERNKEQEEKTDTWHRVERSSGKFMRRFRLPENAKTDQIRASMENGVLTVTVP
                                                                                                                   SLFPSFPRTSSETAAFAG------ARIDWKETPEAHVFKADVPALKKE-EVKVEVED 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PENANPDGITAAMDKGVLVVTVPKREPPAKPEPKRIAV 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FELHADAPGMGPD-DVKVELQEGVLMVTGERKLSHTTKEAGGKVWRSERTAYSFSRAFSL 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YEVRAELPGVDPDKDVHIMVRDGQLTIKAERT - - - EQKDLDG - - - RSEFAYGSFVRTVSL 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TVSVAVSEGKPTEKHIQI 139
                                                        GQ-LTIKAERT----EQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVA 126
                                                                                                                                                                      SLEPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRD 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      38;
                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                             stress-induced protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18.8%;
                                                                                                                                                                                                                                                       18.7%; Score 137; DB 2; 32.8%; Pred. No. 1.6e-05;
                                                                                                                                                                                                                              21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 137.5; DB 2;
Pred. No. 1.4e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               D.; Glaczinski, H.; Ottersbach, P.; Ohad, I.; Klopps:
                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                 Length 159
                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         157;
                                                                                                                                                                                                                              16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9;
                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                           5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Evid
J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajina, J.P.; Krieger, J.E.; Kuramae, E.E.; La chado, M.A.; Madeira, A.M.B.N.; Madeira, H.M.F.; Marino, C.L.; Karques, M.V.; Martins A.Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miyaki, C., F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A.; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, A.; Tsuhako, M.H.; Vallada, H.; Van Sluys, M.A.; Verjovski-Almeida, S.; Vettore, A.L. A; Reference number: A59328
                                                                                                                                                                                                             A;Experimental source: strain 9a5c R;Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carras-Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S. submitted to GenBank, June 2000 A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; A;Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franca, E.E.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
```

```
heat shock protein 17.0 - pearl millet
C;Species: Pennisetum americanum (pearl millet)
C;Date: 14-Apr-1998 #sequence_revision 15-May-1998 #text_change
                                                                                                                                                A;Title: The genome sequence of the plant pathogen Xylella fastidiosa A;Reference number: A82515; MUID:20365717 A;Note: for a complete list of authors see reference number A59328 be
                                                                                                                                                                                                                                                                                                                             low molecular weight heat shock protein XF2234 [imported] - Xylella fastidiosa C;Species: Xylella fastidiosa C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 20-Aug-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Cross-references: EMBL:X94191; NID:g1122314; PIDN:CAA63901.1; PID:g1122315 A;Note: the nucleotide sequence was submitted to the EMBL Data Library, December 1995 A;Note: the source is designated as Pennisetum glaucum C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Accession: S72546
A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Molecule type: mRNA
A;Residues: 1-152 <CAV>
4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C;Accession: S72546
R;Cavan, G.P.; Skoet, K.; Stevens, M.J.; Howarth, C.J. Plant Mol. Biol. 30, 1076, 1996
                               A; Molecule type: DNA
A; Residues: 1-160 <SIM>
                                                                                                                 A; Note: for a comple
A; Accession: F82582
                                                                                                                                                                                                                                        R; anonymous, \ The \ Xylella \ fastidiosa Consortium of the Organization for Nucleotide Seq Nature 406, 151-157, 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Title: Sequence announcement.
A;Cross-references: GB:AE004036; GB:AE003849; NID:g9107384; PIDN:AAF85033.1; GSPDB:GN
                                                                                           A; Status: preliminary
                                                                                                                                                                                                                                                                                                    C; Accession: F82582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Reference number: S72545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      135 VPKAEEKKPEVKAIEI 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       144 KEEVKKPEVKSIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               V-AVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LFPEFSELFAAFPSFAGLRPTFDTRLM----RLEDEMKEGRYEVRAELPGVDPDKDVHIMV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VSE-GKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EDGNVLVISGQRSKEKEDKNDRWHRVERSSGQFMRRFRLPGNAKVDQVKAGLENGVLTVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LWDPFDSMFRSIVQSAG-SPDSDTAAFAAARIDWKETPEAHVFKADLPGVKKE-EVKVEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity 33.1
45; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 136.5; Db 2,
Pred. No. 1.6e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 152;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20-Jun-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6;
                                                                                                                                                                                                                                                                                                                                                                                               (strai
```

Carrer

ţ

```
R:Weng, J.; Wang, Z.F.; Nguyen, H.T. submitted to the EMEL Data Library, February 1992 A;Description: Cloning and characterization of cytoplasmic LMW A;Reference number: S21600 A;Accession: S21600 A;Accession: S21600
                                                                                                                                                                                  heat shock protein 16.9B - wheat
C;Species: Triticum aestivum (common wheat)
C;Date: 08-Jun-1994 #sequence_revision 12-May-1995 #text_change 13-Aug-1999
C;Accession: S21600
R;Weng, J.; Wang, Z.F.; Nguyen, H.T.
                                                                                                                                                                                                                                                                                                      RESULT
S21600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nature 399, 323-329, 1999
A;Title: Evidence for lateral gene transfer between Archaea and Bacteria from genome sec A;Reference number: A72200; MUID:99287316
A;Accession: D72385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Accession: D72385
R;Nelson, K.E.; Clayton, R.A.; Gill, S.R.; Gwinn, M.L.; Dodson, R.J.; Haft, D.H.; Hi R;Nelson, K.E.; Ctayton, R.M.; Cotton, M.D.; Pratt, M.S.; Phillips, C.A.; Richardson, Garrett, M.M.; Stewart, A.M.; Cotton, M.D.; Pratt, M.S.; Phillips, C.A.; Richardson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Contents: annotation C;Genetics: A;Gene: XF2234
                                                                                                                                                                                                                                                                                                                                                                                                 д
                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      븡
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Gene: TM0374
C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Experimental source: strain C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Molecule type: DNA
A;Residues: 1-147 <ARN>
A;Cross-references: GB:AE001717; GB:AE000512; NID:g4980871; PIDN:AAD35461.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                          A; Molecule type: mRNA
A; Residues: 1-151 <WEN>
                                                                     A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          at shock protein, class I - Thermotoga maritima (strain MSB8)
Species: Thermotoga maritima
(paries: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 21-Jul-2000
(accession: D72385
Cross-references: EMBL:X64618; NID:g21804; PIDN:CAA45902.1; PID:g21805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      105 SFHRRFALPDSADADGITASGSHGVLSIFIP-KRAATTPRRIQV 147
                                                                                                                                                                                                                                                                                                                                                                                                                                          120 ILTVSVAVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity 30.7
nes 43; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LQREIDRLFDDFFRTEVRPAKEFFAPDMDVYET----DDEV-----VIEVEIPGID-RK 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DVHIMVRDGQLTIKAERTEQKDLDGRS----EFAYGSFVRTVSLPVGADEDDIKATYDKG 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VQRHPRSLFPEF--SELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDK 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RLEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAER----TEQKDLDGRSEFAYG 95
                                                                                                                                                                                                                                                                                                                                                                                                 VLTIRVPKKEER-KKKVIEV 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DVKITVEENILKISGEKKLEREQKGKNYYYVERSAGKFERAIRLPDYVDVEKIKAEYKNG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SFVRTVSLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RVDIKEEPNQFVLYADLPGIDP-ADIEVQMDKGILSIKGERKTESSSQTEHFSRIERRYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              . Similarity
34; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18.2%; Score 133; DB 2; 30.7%; Pred. No. 3.3e-05; vative 27; Mismatches 52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18.5%;
32.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MSB8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 135; DB 2;
Pred. No. 2.4e-05;
3; Mismatches 41;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 147;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                           HSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6,
                                                                                                                                         genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  104
                                                                                                                                           from wheat.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PID: g49808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Hickey
```

Search completed: Job time: 263 sec

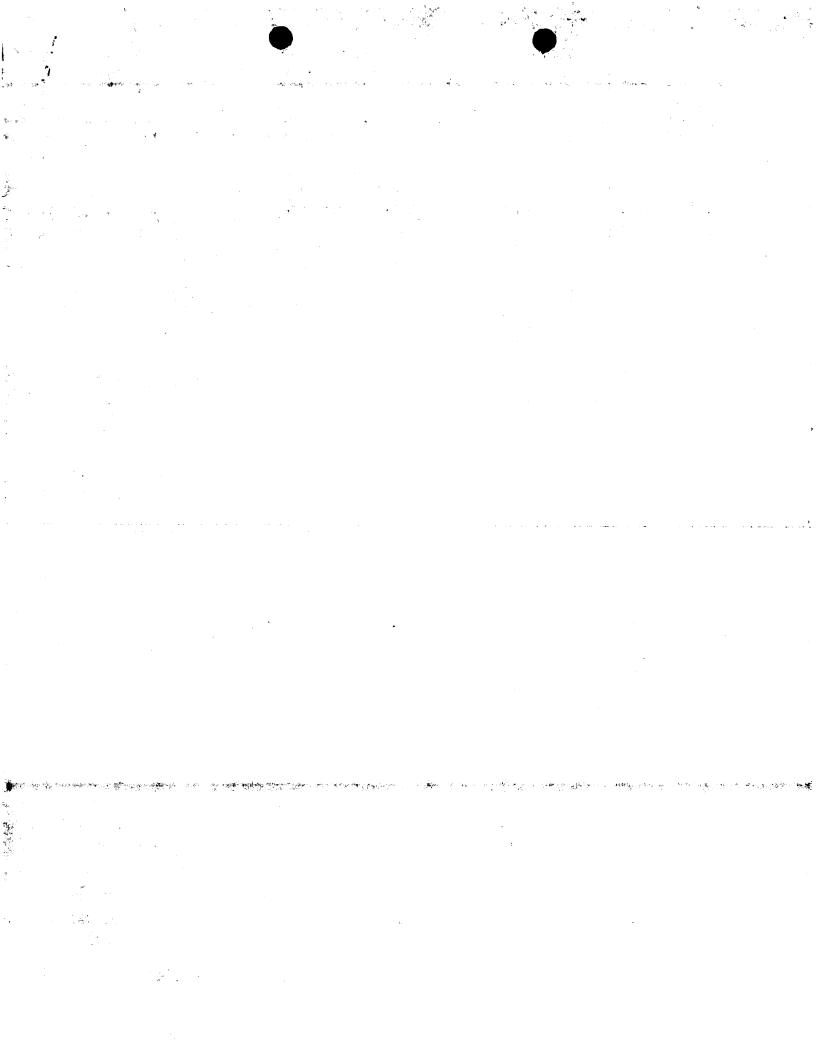
January

υ , 2001,

14:28:42

```
C;Accession: A75436
R;White, O.; Eisen, J.A.; Heidelberg, J.F.; Hickey, E.K.;
M.; Shen, M.; Vamathevan, J.J.; Lam, P.; McDonald, L.;
S.; Smith, H.O.; Venter, J.C.; Fraser, C.M.
Science 286, 1571-1577, 1999
A;Title: Genome sequence of the radioresistant bacterium A;Reference number: A75250; MUID:20038896
A;Accession: A75436
                          δÃ
                                                                Db
                                                                                               QΥ
                                                                                                                                                                   γ
                                                                                                                                                                                                                                                                                         A;Gene: DR1114
A;Map position: 1
C;Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                                             heat shock protein, HSP20 family - Deinococcus radiodurans (strain C;Species: Deinococcus radiodurans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
В
                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C;Date: 03-Dec-1999 #sequence_revision 03-Dec-1999 #text_change 17-Mar-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C; Superfamily: alpha-crystallin
                                                                                                                                                                                                                                                                                                                                               C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A75436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                118
139 PRSEA-AQKRSISVRS
                              126 AVSEGKPTEKHIQIRS 141
                                                                                                                                                                                                       Local Similarity
hes 45; Conserv
                                                                  80
                                                                                                  70
                                                                                                                                    24
                                                                                                                                                                   14 FPEFSELF----AAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMV 69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NGVLTVTVPKAEVKKPEVKAIQI 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KGILTVSVAVSE-GKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -EVKVEVEDGNVLVVSGERTKEKEDKNDKWHRVERSSGKFVRRFRLLEDAKVEEVKAGLE 126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KDVHIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGADEDDIKATYD 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NVFDPFADLWADPFDTFRSIVPAISGGGSETAAFANARMDWKETPEAHVFKADLPGVKKE 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SLFPEFSELFA-AFPSFAGLRPTF-----DTRLM----RLEDEMKEGRYEVRAELPGVDPD 62
                                                                                               RDGQLTIKAERTEQKDLDGRS----EFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSV 125
                                                                                                                                  FREIEELTQRMDRAFASGGAQTTRFAPPVDVHEDEQ---GLELTLDIPGVKPE-DIQIEA 79
                                                                  ENQTLTVQAERRYSRG-EGRTAHRVERAYGTFTRTFSVPAKYDLTKVEADFDHGTLNLRV 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         18.2%;
                                                                                                                                                                                                                        18.2%;
33.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           28;
                                                                                                                                                                                                        21;
                                                                                                                                                                                                     Score 133; DB 2; I
Pred. No. 4.3e-05;
                                                                                                                                                                                                                                                                                                                                                                                 GB:AE000513; NID:g6458843;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 133; DB 2;
Pred. No. 3.4e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E.K.; Peterson,
, L.; Utterback,
                                                                                                                                                                                                                                         Length 182;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Deinococcus radiodurans
                                                                                                                                                                                                                                                                                                                                                                                 PIDN: AAF10685.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           16;
                                                                                                                                                                                                        14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    J.D.;
T.; Za
                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .; Dodson,
Zalewski,
                                                                                                                                                                                                                                                                                                                                                                                 PID:9645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7;
                                                                                                                                                                                                        6;
```

C.;



```
Minimum DB :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                          74
71
69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  seq
                   protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Issued_Patents_AA:*

1: /cgn2_6/ptodata/2;

2: /cgn2_6/ptodata/2;

3: /cgn2_6/ptodata/2;

4: /cgn2_6/ptodata/2;

5: /cgn2_6/ptodata/2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Match Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      January 5, 2001, 14:27:33; Search time 45.19 Seconds (without alignments) 56.824 Million cell update
       US-09-461-774-8
731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   174772 segs, 17957048 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTLPVQRHPRSLFPEFSEL.....SVAVSEGKPTEKHIQIRSTN
                                                      /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/6_COMB.pep:*
/cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2000000000
   388
5466
5466
55466
15286
15286
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
15288
US-08-470-260-6
US-08-461-662-2
US-08-463-092B-6
US-08-463-109A-6
US-08-463-179A-6
US-08-463-179A-6
US-08-463-179A-6
US-08-463-189D-2
US-08-483-189D-2
US-08-838-189D-2
US-08-98-95-344D-2
US-08-98-95-95-1
US-08-98-98-92-92
US-08-98-889-2
US-08-98-889-2
US-08-818-25-3-6
US-08-818-25-3-6
US-08-433-522A-2
US-08-433-522A-2
US-08-433-522A-2
US-08-433-522A-2
US-08-433-522A-2
US-08-433-522A-2
US-08-433-522A-2
                                                                                                                                                                                                                                                                                                                                                                                                                       US-08-900-407-4
US-08-900-407-3
US-08-261-110A-2
                                                                                                                                                                                                                                                                                                                                                                                         US-08-261-110A-4
US-08-467-822-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SUMMARIES
                                                                                                                                                                                                  Sequence 2, Al Sequence 30, Al Sequence 6, Al Sequence 2, Al Sequence 3, Al Sequence 4, Al Sequence 4, Al Sequence 4, Al Sequence 5, Al Sequence 6, Al Seque
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Description
                                                                                                                                   Sequence
Sequence
Sequence
Sequence
                                                  Sequence
Sequence
                                                                                  Sequence
                                                                                                     Sequence
                                                                                                                   Sequence
                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cell updates/sec
                                                                                                                                                                                      ννννοσοσο
Appli
                                                                                                                                                                                                                                                                                                                                                                                                       Appli
Appli
Appli
Appli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-08-900-407-4
; Sequence 4, Ap
; Patent No. 596
                                                                  ; CLONE: US-08-900-407-4
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CITY:
STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    , Application US/08900407
5962262
```

45	44	43	42	41	40	39	38	37	36	35	34	ω	32	31	30	29
63.5	63.5	63.5	63.5	63.5	63.5	63.5	64	64	64	64	64.5	64.5	65	65	65.5	65.5
8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.8	8.8	8 8	8.8	8.8	8.8	8.9	8.9	9.0	9.0
2620	2620	2620	1349	997	997	997	969	969	969	969	793	793	1093	969	797	797
N	2	ш	2	N	2	ب	4	ب	<u> </u>	ب	w	w	4	4	w	ω
US-08-904-686A-32	US-08-384-616-32	US-08-324-977-32	US-08-612-734B-2	US-08-904-686A-50	US-08-384-616-50	US-08-324-977-50	PCT-US92-06888-3	US-08-145-138A-3	US-07-747-781-3	US-08-365-689-3	US-09-135-166-10	US-08-433-522A-10	PCT-US93-03077-1	PCT-US93-03027-4	US-09-135-166-6	US-09-135-166-4
32		Sequence 32, Appl	Sequence 2, Appli	50,	50,	Sequence 50, Appl	Sequence 3, Appli	Sequence 3, Appli	Sequence 3, Appli	Sequence 3, Appli	Sequence 10, Appl	Sequence 10, Appl	Sequence 1, Appli	Sequence 4, Appli	6,	Sequence 4, Appli

ALIGNMENTS

```
APPLICATION NUMBER: US/08/900.

APPLICATION NUMBER: US/08/900.

FILING DATE: Filed Herewith
PRIOR APPLICATION NUMBER:

APPLICATION NUMBER:

ATTORNEY/AGENT INFORMATION:

NAME: Billings, Lucy J.

REGISTRATION NUMBER: 36,749

REFERENCEY/DOCKET NUMBER: PF-0.

TELECOMMUNICATION INFORMATION:

TELEPHONE: 415-855-0555

TELEPAX: 415-845-4166

INFORMATION FOR SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
APPLICANT: Hillman, Jennifer
APPLICANT: Lal, Preeti
APPLICANT: Corley, Neil C.
APPLICANT: Shah, Purvi
TITLE OF INVENTION: NEW HUMAN HEAT SHOCK 27
TITLE OF INVENTION: PROTEIN
NUMBER OF SEQUENCES: 4
                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER: IBM Compatible
OPERATING SYSTEM: DOS
SOFTWARE: FASCEED for Windows Version
CURRENT APPLICATION DATA:
                                                    TOPOLOGY: line
IMMEDIATE SOURCE:
                                                                                                                            SEQUENCE CHARACTERISTICS:
LENGTH: 199 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM: MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS
LIBRARY: GELL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNTRY: U:
ZIP: 94304
                                                                                        TYPE: amino acid
STRANDEDNESS: sir
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADDRESSEE: Incyte Pharmaceuticals, STREET: 3174 Porter Dr.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Palo Alto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USA
                                                                            linear
                                                                                        single
                                                                                                                                                                                                                                                                                                                                                                                                                   US/08/900,407
                                                                                                                                                                                                                                                         PF-0351 US
```

10.2%;

Score Pred.

74.5; No. 0.

DB . 24; 2;

Length 199;

```
밁
   ş
                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                   US-08-900-407-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-08-900-407-3; Sequence 3, Application US/08900407; Patent No. 5962262; Patent No. The Sequence of the Seque
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                          Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
j
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOFTWARE: FASTSEQ for Windows CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/900
FILING DATE: Filed Herewith
PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: Billings, Lucy J.
REGISTRATION NUMBER: 36,749
REFERENCE/DOCKET NUMBER: PF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Corley, Neil C. APPLICANT: Shah, Purvi TITLE OF INVENTION: NEW HUM.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY: line
IMMEDIATE SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                          MEDILL
LIBRARY: General
TONE: 63522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        177 NEITIPVT 184
   67 ---IMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYD-KGILT 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       135 KHIQIRST 142
                                                                         49
                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                     12 SLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVH----- 66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER: IBM CONTOPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: amino acid
STRANDEDNESS: si
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CITY: Palo Alto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELEFAX:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COUNTRY: UZIP: 94304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENGTH:
                                                                      SAWPGY---FRLLPSESALLPAPGSPYGRALSELSSGISEIRQSADSWKVTLDVNHFAPE 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAIESPAVAAPAYSRALSRQLSSGVSEIRHTADRWRVSLDVNHFAPD-ELTVKTKDGVVE 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ITGKHEERQDEHG---YISRCFTRKYTLPPGVDPTQVSSSLSPEGTLTVEAPMPKLATQS 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYD-KGILTVSVAVSEGKPTE 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAFPSFAGLRPTFDTRLMR-LEDEMKE-----GRYEVRAELPGVDPDKDVHIMVRDGQLT 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   193 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3174 Porter Dr.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Corley, Neil C.
Shah, Purvi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                415-845-4166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         USA
                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hillman, Jennifer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                      GenBank
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FastSEQ for Windows Version 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                415-855-0555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Incyte Pharmaceuticals, Inc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Preet
                                                                                                                                                                                                    9.8%; Score 71.5; DB 2; Length 193; 23.4%; Pred. No. 0.52; ative 23; Mismatches 65; Indels 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NEW HUMAN HEAT SHOCK 27 LIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US/08/900,407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ω..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PF-0351 US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                           17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11;
                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                       5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5
```

```
밁
                                                                                                                                    밁
                                                            δÃ
                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-08-261-110A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PAtentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/261,110A
FILING DATE: 16-JUN-1994
CLASSIFICATION: 536
PRIOR APPLICATION DATA:
APPLICATION UNMBER: US 07/938,332
FILING DATE: 28-AUG-1992
ATTORNEY/AGENT INFORMATION:
NAME: TIMING STANKING STA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 2, Application US/08261110A
Patent No. 5674992
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELEPHONE: (716) 263-1636
TELEFAX: (716) 263-1600
INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME: TIMIAN, SUSAN J.
REGISTRATION NUMBER: 34,103
REFERENCE/DOCKET NUMBER: 19
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TOPOLOGY: linear MOLECULE TYPE: pro
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION:
118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 123
                                                            118 KGILTVSVAVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             163 VEAPLP--KPAIQSSEI 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              106 ELVVKTKDNIVEITGKHEEKQDEHG---FISRCFTRKYTLPPGVEATAVRSSLSPDGMLT 162
                                                                                                                                    70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COUNTRY:
                                                                                                                                                                                                 58 GVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYD 117
                                                                                                                                                                                                                                                                         10 LNPSFTPLSPLFPFTPCSSFSPSLRFSSCYSRRLYSPVTVYAAKKLSHKISSEFDDRING 69
                                                                                                                                                                                                                                                                                                                                             13 LFPEFSELFAAFP----SFAGLRPTFDTRLMRLEDEM-----KEGRYEVRAELP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE:
SGILTLDLALGGGLPKGRVVEI 139
                                                                                                                                 ALSPDADSRFLDRQ-----KALEAAMNDIN--SSFGKGSVTR-----LGSAGGALVETFS 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VSVAVSEGKPTEKHIQI
                                                                                                                                                                                                                                                                                                                                                                                                                 34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  14603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ROCHESTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NEW YORK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   438 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E: NIXON, HARGRAVE, DEVANS & DOYLE LLP CLINTON SQUARE, P.O. BOX 1051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  USA
                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CERUTTI, HERIBERTO
VENTION: CDNA ENCODING A reca HOMOLOG IN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JAGENDORF, ANDRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              not relevant
                                                                                                                                                                                                                                                                                                                                                                                                                                                  9.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EUKARYOTES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 139
                                                                                                                                                                                                                                                                                                                                                                                                                 22;
                                                                                                                                                                                                                                                                                                                                                                                                          Score 69.5; DE Pred. No. 3.1; 22; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        19603/10231(D-1292A)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB
                                                                                                                                                                                                                                                                                                                                                                                                                 59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 438;
                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                 27;
                                                                                                                                                                                                                                                                                                                                                                                                              Sdrij
                                                                                                                                                                                                                                                                                                                                                 57
                                                                                                                                                                                                                                                                                                                                                                                                                 6;
```

US-08-261-110A-4

```
RESULT 5
US-08-467-822-30
                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-08-261-110A-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PAGENTION: 56/407
PATENT ON. 56/407
GENERAL INFORMATION:
APPLICANT: JACENDORF, ANDRE
APPLICANT: CERUTTI, HERIBERTO
APPLICANT: CERUTTI, HERIBERTO
CERUTTION: CDNA ENCOCING A recA HOMOLOG IN
CHARLES OF INVENTION: EUKARYOTES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Loc
Matches
                                                                                                                                                                                                                                        Sequence 3 Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 4, Application US/08261110A Patent No. 5674992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX: (716) 263-1600
INFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
LENGTH: 388 amino acids
                                                                                                                                                         APPLICANT:
APPLICANT:
                                                         APPLICANT: Thiberge, Jean-Michel
TITLE OF INVENTION: HELICOBACTER INFECTION, POLYPEPTIDES FOR USE IN THE
TITLE OF INVENTION: COMPOSITIONS, AND NUCLEIC ACID SEQUENCES ENCODING SAID
TITLE OF INVENTION: POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME: TIMIAN, SUSAN J.
REGISTRATION NUMBER: 34,103
REFERENCE/DOCKET NUMBER: 199
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRANDEDNESS:
TOPOLOGY: 111
MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 0:
FILING DATE: 28-AUG-1992
ATTORNEY/AGENT INFORMATION:
                      NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                119 GILTVSVAVSEGKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                           69 GILTLDLALGGGLPKGRVVEI 89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE: NIXON, HARGRAVE, DEVANS & DOYLE LLP STREET: CLINTON SQUARE, P.O. BOX 1051
CITY: ROCHESTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: FILING DATE: 16-JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                         21 LSPDADSRFLDRQ-----KALEAAMNDIN--SSFGKGSVTR-----LGSAGGALVETFSS 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         59 VDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDK 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
les 22; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE:
                                                                                                                                                                                                                    INFORMATION:
                                                                                                                                                                                                                                        30, Application US/08467822
5. 5843460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NEW YORK
                                                                                                                                                         Labigne, Agnes
Sauerbaum, Sebastien
Ferrero, Richard L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             linear
Finnegan, Henderson, Farabow, Garrett &
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (716) 263-1636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              16-JUN-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           not relevant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9.4%; Score 69;
27.2%; Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US 07/938,332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US/08/261,110A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19603/10231(D-1292A)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ω
--
```

```
В
                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                          US-08-470-260-6
                                                                                                                                                                                                                                                                                                                                         QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-467-822-30
                                                                                                                                                                                  Sequence 6, Application Patent No. 6077706 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX: (202) 408-44
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ZIP: 20005-331.
ZIP: 20005-331.
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
MEDIUM TYPE: IBM PC compatible
COMPUTER: IBM PC compatible
COMPUTER: PC-005/MS-DOS
C-10969 #1.0
                                                                                                                                                  APPLICANT:
                                                             APPLICANT: Bugnoli, Massimo
APPLICANT: Telford, John
APPLICANT: Macchia, Giovanni
APPLICANT: Rappuoli, Rino
TITLE OF INVENTION: Helicobacter
TITLE OF INVENTION: for Vaccines
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOFTWARE: Patentin Rel
CURRENT APPLICATION DATA:
                               CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 545 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MOLECULE TYPE:
                                                    NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                           444 KAPLA--QIAINAGYDGG-----VVVNEVEKHEGHFGFNASN 478
                                                                                                                                                                                                                                                                                                                                         102 SLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                           384 EVEMKEKKDRVDDALSATKAAVEEGIVIGGGAALIRAAQKVHLNLHDDEKVGYEIIMRAI 443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE: 19-MAY-1995
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                          42 EDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTV 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE: 02 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: amino acid
STRANDEDNESS: sin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: FILING DATE: 06-JUI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
               ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Meyers, Kenneth
                                                                                                                                                                                                                     Application US/08470260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  D.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  E: Dunner
1300 I Street, N.W
3: Chiron Corporation 4560 Horton Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (202)
                                                                                                                                                                   Covacci, Antonello
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein
1..545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (202) 408-4000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      02-MAY-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            06-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      408-4400
                                                                                                                                                                                                                                                                                                                                                                                                                                                             9.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product= "H. pylori - Hsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US 08/432,697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US 08/447,177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US/08/467,822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25,146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30:
                                                                                                                                                                                                                                                                                                                                                                                                                                              16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       03495.0137-02000
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 68.5; D
Pred. No. 5.8;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                 and Diagnostics
                                                                                  Pylori Proteins Useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 545;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₩.
                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
```

Ν

COUNTRY:

Emeryville California

94608-2916

```
; TYPE: PRT
; ORGANISM: Helicobacter pylori
US-08-471-491-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-470-260-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEFAX: (510) 655-3542
INFORMATION FOR SEQ ID NO: 6:
SEQUENCE CHARACTERISTICS:
LENGTH: 546 amino
Matches
                                                                                                                                                                         SOFTWARE: PatentIn
SEQ ID NO 6
                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
APPLICANT: Covacci, Antonello
APPLICANT: Bugnoli, Massimo
APPLICANT: Telford, John
APPLICANT: Macchia, Giovanni
APPLICANT: Macchia, Giovanni
APPLICANT: Rappuoli, Rino
TITLE OF INVENTION: Helicobacter Pylori Proteins Useful For Vaccines
FILE REFERENCE: CHIRO044
                        Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                   equence 6, Appli-
patent No. 609061
                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/08/471,491B
CURRENT FILING DATE: 1995-06-06
NUMBER OF SEQ ID NOS: 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         08-471-491-6
                                                                                                                                                       LENGTH: 546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME: MCClung, Barbara G.
REGISTRATION NUMBER: 33,113
REFERENCE/DOCKET NUMBER: 0316.001
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE: 21-OCT-1994
ATTORNEY/AGENT INFORMATION:
NAME: McClung, Barbara G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           102 SLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  445 KAPLA--QIAINAGYDGG-----VVVNEVEKHEGHFGFNASN 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         385 EVEMKEKKDRVDDALSATKAAVEEGIVIGGGAALIRAAQKVHLNLHDDEKVGYEIIMRAI 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity 25.9 Local Similarity 25.9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH: 546 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            42 EDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTV 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: US 08/256,848 FILING DATE: 21-OCT-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER:
           26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Application US/08471491B
       9.4%; Scilarity 25.5%; Pr
Conservative 16;
                                                                                                                                                                                              Ver.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US/08/470,260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16;
       Score 68.5; DB Pred. No. 5.8; 16; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 68.5; DF Pred. No. 5.8; 16; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .8
                                              DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 3; Length 546;
         53;
                                          Length 546;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
         7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
         2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2
```

```
US-08-463-092B-6
Sequence 6, Application US/08463092B
Patent No. 5766880
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ; TYPE: PRT; ORGANISM: Helicobacter pylori
US-08-466-662-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-466-662-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
APPLICANT: Covacci, Antonello
APPLICANT: Bugnoli, Massimo
APPLICANT: Telford, John
APPLICANT: Macchia, Giovanni
APPLICANT: Macchia, Giovanni
APPLICANT: Rappuoli, Rino
TITLE OF INVENTION: Helicobacter Pylori Proteins Useful For Vaccines A.d
TITLE OF INVENTION: Diagnostics
FILE REFERENCE: CHIR0057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION NUMBER: US/08/466,662B
CURRENT FILING DATE: 1995-06-06
NUMBER OF SEQ ID NOS: 8
SOFTWARE: PatentIn Ver. 2.1
SEQ ID NO 6
LENGTH: 546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 9.4%; Score 68.5; Best Local Similarity 25.5%; Pred. No. 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 6, Application US/08466662B Patent No. 6130059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Patent No.
                 SOFTWARE: ASCII text
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/01
FILING DATE: 05-JUN-1995
                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES: 9
                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Cole, Susan P.C.
APPLICANT: Deeley, Roger G.
TITLE OF INVENTION: ISOLATED NUCLEIC ACID MOLECULES ENCODING
TITLE OF INVENTION: MULTIDRUG RESISTANCE PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     102 SLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            445 KAPLA--QIAINAGYDGG-----VVVNEVEKHEGHFGFNASN 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      385 EVEMKEKKDRVDDALSATKAAVEEGIVIGGGAALIRAAQKVHLNLHDDEKVGYEIIMRAI 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        445 KAPLA--QIAINAGYDGG-----VVVNEVEKHEGHFGFNASN 479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  385 EVEMKEKKDRVDDALSATKAAVEEGIVIGGGAALIRAAQKVHLNLHDDEKVGYEIIMRAI 444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    102 SLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                           COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                      STREET: Queen's
CITY: Kingston
STATE: Ontario
                                                                                                                                                                                                          COUNTRY: CANADA ZIP: K7L 3N6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                42 EDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTV 101
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              42 EDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTV
                                                                                                                                                                                                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                               E: PARTEQ RESEARCH & DEVELOPMENT INNOVATIONS Queen's University at Kingston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                             MULTIDRUG
9
                                         US/08/463,092B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              16; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 546;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                101
```

PRIOR APPLICATION DATA:

07/966,923

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-08-462-109A-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-463-092B-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 6, Application US/08462109A
Patent No. 5882875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEFAX: (613) 545-685 INFORMATION FOR SEQ ID NO:
                                                                                         COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: ASCII text
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                  EMERAL INFORMATION:
APPLICANT: Cole, Susan P.C.
APPLICANT: Deeley, Roger G.
TITLE OF INVENTION: METHODS FOR IDENTIFYING
TITLE OF INVENTION: MULTIDRUG RESISTANT TUMOR CELLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION: 435
PRIOR APPLICATION DATA:
08/141,893
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 07/966,923
                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES: 6
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE CHARACTERISTICS:
LENGTH: 1528 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/407,207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             882 -SVSGSGKESKPVENGMLVTDTVGKHLQRHLSN 913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121 LTVSVAVSEGKPTE-----KHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                833 PQVDVIIVMSGGKISEMGSYQELLDRDG----AFAEFLRTYA----NAEQDLASEDD--- 881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLFVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                               STATE:
                                                                                                                                                                                                                                                                             STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME: Steeg, Carol Miernicki
REGISTRATION NUMBER: 39,539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE: 20 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE: 26 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: 08/0FILING DATE: 8-MAR-1993
                                                         FILING DATE:
                                                                        APPLICATION NUMBER: US/08/462,109A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: 07/90 FILING DATE: 27-0CT-1992
                                                                                                                                                                                                                                                                                                 ADDRESSEE:
                                                                                                                                                                                                          02109
                                                                                                                                                                                                                                                              Boston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          amino acid
                                                                                                                                                                                                                                         Massachusetts
                                                                                                                                                                                                                                                                             60 State Street, suite 510
                                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (613) 545-2342
(613) 545-6853
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                 LAHIVE & COCKFIELD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26-0CT-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20-MAR-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9.3%; Score 68; DB 28.0%; Pred. No. 31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   08/029,340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q1546
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 1; Length 1528;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4;
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; TOPOLOGY: 11; MOLECULE TYPE: US-08-462-109A-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-460-907B-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 6, Application US/08460907B Patent No. 5891724
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEFAX: (617) 227-5941 INFORMATION FOR SEQ ID NO: 6:
                                                                                                                     CLASSIFICATION: 424
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 07/966,923
FILING DATE: 27-0CT-1992
                                                                                                                                                                                          SOFTWARE: ASCII text
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US,
FILING DATE: 05-JUN-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
LENGTH: 1528 amino aci
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REGISTRATION NUMBER: 31,503
REFERENCE/DOCKET NUMBER: 91
TELECOMMUNICATION INFORMATION:
TELEPHONE: (617) 227-7400
CLASSIFICATION: 424
PRIOR APPLICATION NUMBER: (
                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: Deeley, Roger G. APPLICANT: Cole, Susan P.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE: 20-MAR-1995
ATTORNEY/AGENT INFORMATION:
                                                                                      CLASSIFICATION: 424
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   882 -SVSGSGKESKPVENGMLVTDTVGKHLQRHLSN 913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121 LTVSVAVSEGKPTE-----KHIQIRSTN 143
                                                   APPLICATION NUMBER: FILING DATE: 8-MAR-
                                                                                                                                                                                                                                                                 COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                         STREET: Queen's
CITY: Kingston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
nes 26; Conserv
                                                                                                                                                                                                                                                                                                                                         COUNTRY: CANADA ZIP: K7L 3N6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FILING DATE: 26-0C APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                   MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE: 27-0C1 APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PQVDVIIVMSGGKISEMGSYQELLDRDG----AFAEFLRTYA----NAEQDLASEDD--- 881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DeConti, Giulio A. Jr. RATION NUMBER: 31,503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      amino acid
                                                                                                                                                                                                                                                                                                                                                                       Ontario
                                                                                                                                                                                                                                                                                                                                                                                                        E: PARTEQ RESEARCH & DEVELOPMENT INNOVATIONS Queen's University at Kingston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1528 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       linear
                                                   8-MAR-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8-MAR-1993
                                                                                                                                                                                             05-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26-0CT-1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27-0CT-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9.3%;
28.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  METHODS FOR CONFERRING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESISTANCE ON A CELL
                                                                                                                                                                                                            US/08/460,907B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    08/407,207
08/141,893
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   08/141,893
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          08/029,340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PQI-002CP4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 68;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 2; Length 1528;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MULTIDRUG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
```

CLASSIFICATION: 424
PRIOR APPLICATION DATA:

APPLICATION NUMBER: FILING DATE: 20-MA

20-MAR-1995

08/407,207

4

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-463-179A-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JS-08-460-907B-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE/DOCKET NUMBER: Q155
TELECOMMUNICATION INFORMATION:
TELEPHONE: (613) 545-2342
TELEFAX: (613) 545-6853
INFORMATION FOR SEQ ID NO: 6:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 6, Application US/08463179A Patent No. 6001563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                               CLASSIFICATION: 536
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 07/966,923
FILING DATE: 27-0CT-1992
APPLICATION NUMBER: 08/029,340
FILING DATE: 8-MAR-1993
APPLICATION NUMBER: 08/141,893
FILING DATE: 26-0CT-1993
APPLICATION NUMBER: 08/407,207
FILING DATE: 70-MAR-1046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
APPLICANT: Cole, Susan P.C.
                   FILING DATE: 20-MAR-1995
ATTORNEY/AGENT INFORMATION:
NAME: DECONTI, Giulio A. Jr.
REGISTRATION NUMBER: 31,503
REFERENCE/DOCKET NUMBER: PQI
                                                                                                                                                                                                                                                                                                                                                            MEDIUM TYPE: Floppy disk
COMPOTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: ASCII text
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Cole, Susan P.C.
APPLICANT: Deeley, Roger G.
TITLE OF INVENTION: METHODS FOR IDENTIFYING CHEMOSENSITIZERS
NUMBER OF SEQUENCES: 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY/AGENT INFORMATION:
NAME: Steeg, Carol Miernicki
REGISTRATION NUMBER: 39,539
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
ADDRESSEE: LAHIVE & COCKFIELD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      882 -SVSGSGKESKPVENGMLVTDTVGKHLQRHLSN 913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121 LTVSVAVSEGKPTE-----KHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       833 PQVDVIIVMSGGKISEMGSYQELLDRDG----AFAEFLRTYA----NAEQDLASEDD--- 881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: Boston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61 PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                                                                                                                       FILING DATE:
                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          02109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Massachusetts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1528 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60 State Street, suite 510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9.3%; Score 68; DB 2; Length 1528; 28.0%; Pred. No. 31;
                                                                                                                                                                                                                                                                                                                                             US/08/463,179A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q1551
                       PQI-002CP8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-461-384B-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-08-463-179A-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 6, Application US/08461384B
Patent No. 6025473
GENERAL INFORMATION:
APPLICANT: Cole, Susan P.C.
APPLICANT: Deeley, Roger G.
TITLE OF INVENTION: MULTIDRUG RESISTANCE PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match 9.3%; Score 68; DB Best Local Similarity 28.0%; Pred. No. 31; Matches 26; Conservative 14; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEPHONE: (617) 227-7400
TELEFAX: (617) 227-5941
INFORMATION FOR SEQ ID NO: 6:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                            PILING DATE: 05-JUN-95
PRIOR APPLICATION NUMBER: 07/966,923
APPLICATION NUMBER: 07/966,923
APPLICATION NUMBER: 08/029,340
FILING DATE: 8-MAR-1993
APPLICATION NUMBER: 08/141,893
FILING DATE: 26-0CT-1993
APPLICATION NUMBER: 08/147,207
                                                                                                           INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                            ATTORNEY/AGENT INFORMATION:
NAME: Steeg, Carol Miernicki
REGISTRATION NUMBER: 39,539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: ASCII text
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
TOPOLOGY: 11
                                                                                   SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MOLECULE TYPE: protein
                                                                                                                                                                     TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           882 -SVSGSGKESKPVENGMLVTDTVGKHLQRHLSN 913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             833 PQVDVTIVMSGGKISEMGSYQELLDRDG----AFAEFLRTYA----NAEQDLASEDD--- 881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121 LTVSVAVSEGKPTE-----KHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: ASCII text
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREET: Queen's
CITY: Kingston
STATE: Ontario
                                                                                                                                                                                         REFERENCE/DOCKET NUMBER: 01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: US/08/461,384B FILING DATE: 05-JUN-95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61 PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                                                                             FILING DATE: 20-MAR-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ZIP: K7L 3N6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE: amino acid
TOPOLOGY: linear
                                                              LENGTH:
                                                                                                                                                TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH:
                                      amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1528 amino acids
                                                                  1528 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 E: PARTEQ RESEARCH & DEVELOPMENT INNOVATIONS Queen's University at Kingston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CANADA
                                                                                                                               (613)
                                                                                                                                                  (613) 545-2342
  protein
                                                                                                           6:
                                                                                                                                                                                             Q1547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 1528;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
```

```
ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οy
              В
                                                                                                                                      ; TOPOLOGY: US-08-467-963C-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-467-963C-2
                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 2, Applica Patent No. 5968776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: KLEIN,
APPLICANT: DU, Rur
                                                                                                                                                                                                        TELEFAX: (416) 595-1163 INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                              REFERENCE/DOCKET NUMBER: 10
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                             FILING DATE: 16-APR-1997
APPLICATION NUMBER: US 01
FILING DATE: 06-JAN-1993
PRIOR APPLICATION DATA:
APPLICATION NUMBER: GB 9:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION:
NAME: STEWART, Michael I
                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    882 -SVSGSGKESKPVENGMLVTDTVGKHLQRHLSN 913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 LTVSVAVSEGKPTE-----KHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        833 PQVDVIIVMSGGKISEMGSYQELLDRDG----AFAEFLRTYA----NAEQDLASEDD--- 881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61 PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGI 120
                                         25
                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE:
CLASSIFICATION:
              35
                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ZIP: M5G 1R7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STREET:
                                                                                  Local
                                                                                                                                                                                              LENGTH:
                                                                                                                                                                                                                                                  TELEPHONE:
                                                                                                                                                                                                                                                                                            REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: US/08/467,963C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
             PKGMKISQNFETRYLILSLIPKIEDSNSCGDQQIKQYKRLLDRLIIPLYDGLRLQKDV--
                                       PSFAGLRPTFDTRLM-----RLEDEMKEGRYEV------RAELP---GVDPDKDVHI 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26;
                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Toronto
                                                                                                                                                                              amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Application
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ontario
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6th Floor,
                                                                                                                                                                                           539 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EWASYSHYN, MATY E
VENTION: MULTIMERIC HYBRID GENE ENCODING A
VENTION: CHIMERIC PROTEIN WHICH CONFERS PROTECTION AGAINST
VENTION: PARAINFLUENZA VIRUS AND RESPIRATORY SYNCYTIAL VIRUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Canada
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KLEIN, Michel H
                                                                                                                                                    linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sim & McBurney
h Floor, 330 University Avenue
                                                                                                                                                                                                                                                    (416)
                                                                                                                                                                                                                                                                                                                                     06-JAN-1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Run-Pan
                                                                                                                                                                 single
                                                                                                                                                                                                                                                    595-1155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9.3%;
28.0%;
                                                                                9.2%;
21.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US/08467963C
                                                                                                                                                                                                                                                                                                                                                  GB 9200117.1
                                                                                                                                                                                                                                                                                                                                                                                                                    US 08/838,189
                                                                                                                                                                                                                                                                                         24,973
                                                                                                                                                                                                                        2:
                                                                                                                                                                                                                                                                                                                                                                                         08/001,554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               14;
                                                                                                                                                                                                                                                                               1038-474 MIS:jb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 68;
Pred. No.
                                                                                  Pred.
                                                                                             Score 67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                  Mismatches
                                                                                  No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB
31;
                                                                                             DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3; Length 1528;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31;
                                                                  46;
                                                                                            Length 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22;
                                                                  42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                  Gaps
                                                                  6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρy
                                        В
                                                                  δÃ
                                                                                             DЬ
                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-08-838-189D-2
             δÃ
                                                                                                                                                                                                                        US-08-838-189D-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                    Matches
                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                        TELEFAX: (416) 595-11 INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: Patentin Rel
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION: TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
128 SEGKPTEKHIQ-----IRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STATE: C
                                                                                                                                                                                                                                    TOPOLOGY: linear
                                         93
                                                                  8
                                                                                             35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET:
                                                                                                                         25
                                                                                                                                                                                                                                                                                                                                   TELEPHONE:
                                                                                                                                                                                                                                                                              ENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Toronto
                                                                                                                                                                                                                                                               amino acid
                                                                                                                                                                                                                                                                                                                                                                                       STEWART, Michael
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ontario
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6th Floor,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Canada
                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                     (416)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Run-Pan
                                                                                                                                                                                                                                                    single
```

```
REFERENCE/DOCKET NUMBER: 10 TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: US 08/001,554
FILING DATE: 06-JAN-1993
PRIOR APPLICATION DATA:
APPLICATION NUMBER: GB 9200117.1
FILING DATE: 06-JAN-1992
ATTORNEY/AGENT INFORMATION:
ANALYZAGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
ADDRESSEE: Sim & McBurney
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         135 VEAKQAKSDIEKLKEAIRDIN 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         68 MVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVAV 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REGISTRATION NUMBER: 24,973
                                                                                                                               PSFAGLRPTFDTRLM-----RLEDEMKEGRYEV-----RAELP---GVDPDKDVHI 67
                                                                                    PKGMKISQNFETRYLILSLIPKIEDSNSCGDQQIKQYKRLLDRLIIPLYDGLRLQKDV--
                                      MYRDGQLTIKAERTEQKDLDGRSEFAYGSFYRTYSLPYGADEDDIKATYDKGILTYSYAV 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2, Application US/08838189D
5. 5998169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ----IVTNQESNENTDPRTRRSFGGVIGTIALGVATSAQ-
                                                                                                                                                                                                                                                                                                                                                                        539 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EWASYSHYN, Mary E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KLEIN, Michel H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         E: Floppy disk
IBM PC compatible
-IVTNQESNENTDPRTRRSFGGVIGTIALGVATSAQ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16-APR-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                          595-1163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 595-1155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MULTIMERIC HYBRID GENE ENCODING A
CHIMERIC PROTEIN WHICH CONFERS PROTECTION AGAINST
PARAINFLUENZA VIRUS AND RESPIRATORY SYNCYTIAL VIRUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PC-DOS/MS-DOS
                                                                                                                                                                                          9.2%; Score 67;
21.3%; Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US/08/838,189D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  08/001,554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               University Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1038-687 MIS:jb
                                                                                                                                                                          Mismatches
                                                                                                                                                                                        DВ
3.6;
                                                                                                                                                                                                                 2;
                                                                                                                                                                          46;
                                                                                                                                                                                                                 Length 539;
                                                                                                                                                                          Indels
  --ITAAVAL 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -ITAAVAL 134
                                                                                                                                                                          42;
                                                                                                                                                                        Gaps
                                                                                      92
                                                                                                                                                                          6,
```

Search completed: January 5, 2001, 14:27:36 Job time: 228 sec

Ъ

135 VEAKQAKSDIEKLKEAIRDTN 155

```
Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein search, using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             length:
length:
                                                                                                                                                                                                                                                                                                A_Geneseq_36:*
1: /SIDS1/gcgda
2: /SIDS1/gcgda
3: /SIDS1/gcgda
4: /SIDS1/gcgda
5: /SIDS1/gcgda
6: /SIDS1/gcgda
7: /SIDS1/gcgda
9:
10:
11:
12:
13:
14:
15:
16:
17:
18:
19:
20:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-09-461-774-8
731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 5, 2001, 14:26:43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              268485 seqs, 34193795 residues
                /SIDS1/gcgdata/geneseq/geneseqp/AA1986.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1987.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1987.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1989.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1989.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1991.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1992.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1992.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1993.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1996.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1998.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1998.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1998.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1998.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1998.DAT: *
/SIDS1/gcgdata/geneseq/geneseqp/AA1998.DAT: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GenCore version
Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTLPVQRHPRSLFPEFSEL.....SVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                 /SIDS1/gcgdata/geneseg/geneseqp/AA1980.DAT:*
/SIDS1/gcgdata/geneseg/geneseqp/AA1981.DAT:*
/SIDS1/gcgdata/geneseg/geneseqp/AA1982.DAT:*
                                                                                                                                                                                                                                                                                                                                             /SIDS1/gcgdata/geneseq/geneseqp/AA1984.DAT:*
/SIDS1/gcgdata/geneseq/geneseqp/AA1985.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                             /SIDS1/gcgdata/geneseq/geneseqp/AA1983.DAT:*
/SIDS1/gcgdata/geneseq/geneseqp/AA2000.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4.5
Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Search time 62.98 Seconds (without alignments) 77.639 Million cell update
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                268485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cell updates/sec
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

12	11	10	9	80	7	6	ر ت	4	ω	2	1	Result No.
111	113.5	238	238	238	238	356	718	718	718	718	718	Score
15.2	15.5	32.6	32.6	32.6	32.6	48.7	98.2	98.2	98.2	98.2	98.2	Query Match
153	181	48	48	48	48	131	856	433	368	331	144	Query Match Length
6	14	19	18	17	16	12	20	20	20	20	20	DB
P50065	R43654	W75570	W18183	R92889	R85672	R12489	Y32064	Y32065	Y32069	Y32060	W94900	İĐ
Soybean heat shock	c424 gene product.	M. tuberculosis 12	N-terminal sequenc	Mycobacterium 12 k	12 kD M.tuberculos	Peptide derived fr	Mycobacterium tube	Mycobacterium tube	Mycobacterium tube	Mycobacterium tube	Alpha-crystallin h	Description

68	68	68	68	68	8	68.5	8	8	8	8	69	9	69.5	9.	72	72			Ģ	75.5		76	77	7	81.5	82	85	92	94	101.5	101.5	104.5
			9.3				9.4	9.4	9.4							9.8		٠		10.3				•	•	11.2	•		•	•	•	
1528	1528	1528	1528	423	546	546	546	545	545	545	283	795	472	438	461	405	471	205	1583	1552	1528	975	175	175	156	918	460	149	143	253	148	154
21	20	20	9	20	19	14	14	17	16	16	20	20	21	18	20	20	19	14	18	21	18	19	17	20	21	20	20	σ	σ	16	10	თ
Y55800	W74472	W99895	W57487	Y37283	W98776	R41200	R41661	W06732	R67374	R74339	Y37057	W97842	Y84443	W34668	Y34438	Y34581	W54352	R41022	W20057	Y85577	W20056	W72746	R87512	$\overline{}$	Y77926	Y35654	Y29294	P50064	P50063	7905	P90455	P50066
Murine multidrug r	Mouse multidrug re	Mouse multidrug re	Murine multidrug r	0	H. pylori GHPO 118	icoba	H. pylori hsp60.	H. pylori heat sho	Heat shock protein	Helicobacter pylor	Protein which is s	Human P2Y11 recept	Amino acid sequenc	Arabidopsis thalia		nas gin	Heat shock 27 kD p	=				ᇊ.	alpha i	Renal cancer assoc	A. thaliana enviro	Amino acid sequenc	Protein encoded by	Soybean heat shock	Soybean heat shock	7.0	Antigens of Mycoba	Soybean heat shock

ALIGNMENTS

```
RESULT
W94900
Alpha-crystallin heat shock protein
                                                         W94900;
                                                                                    W94900 standard; Protein; 144
                            11-MAY-1999
                            (first entry)
                                                                                     B
```

Tuberculosis; Mycobacterium; alpha-crystallin heat shock protein; acr gene; attenuated; vaccine; antimycobacterial; pathogenic.

```
Novel attenuated strains of Mycobacterium tuberculosis and M. useful in the production of a vaccine against tuberculosis, achieved by reducing or eliminating expression of the alpha-crystallin heat shock protein gene
                                                                                                              WPI; 1999-120871/10.
N-PSDB; X17761.
                                                                                                                                                                              Barry CE,
                                                                                                                                                                                                                                                                                                                                                                                                        WO9902670-A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacterium
                                                                                                                                                                                                                          (USSH ) US DEPT HEALTH & HUMAN SERVICES.
                                                                                                                                                                                                                                                                     10-JUL-1997;
                                                                                                                                                                                                                                                                                                                 09-JUL-1998;
                                                                                                                                                                                                                                                                                                                                                             21-JAN-1999
                                                                                                                                                                              Crane D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp
                                                                                                                                                                                                                                                                     97US-0052199.
                                                                                                                                                                                                                                                                                                                 98WO-US14227
                                                                                                                                                                                   Yuan Y;
```

M. bovis

0

```
uery Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and M. tuberculosis, used for commercial adjuvants, used as diagnostics including use as reagents for the development of monoclonal antibodies to recognize wild type mycobacteria in patient samples. The vaccine is based on M. tuberculosis and is obtained without the multitude of passages so that the immune response generated is more relevant to the wild type, pathogenic bacteria. The present sequence represents the alpha-crystalline heat shock protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The invention relates to a vaccine for protection against tuberculosis which Mycobacterium sp. are attenuated by having the expression of the alpha-crystallin heat shock protein gene (acr gene) reduced by at least 75 percent. The attenuated strains can be used as models for screening for novel antimycobacterial agents. Also, the mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for detection of exposure to M. boyis and M. the Mixture of Mycobacterium sp. cellular debris can be used for debris can be used for detection of exposure to M. boyis and M. the Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture of Mixture o
Skeiky YAW,
                                                                                                 07-APR-1998;
30-DEC-1998;
                                                                                                                                                                       07-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tuberculosis; antigen; fusion protein; Mtb39A; ERD14; DPV; MTI; diagnosis; therapy; vaccine; immunogen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    17-JAN-2000
                                                  (CORI-) CORIXA CORP
                                                                                                                                                                                                                    14-OCT-1999
                                                                                                                                                                                                                                                                      W09951748-A2
                                                                                                                                                                                                                                                                                                                                            Protein
                                                                                                                                                                                                                                                                                                                                                                                         Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Y32060 standard; Protein; 331 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Examples; Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ltvsvavsegkptekhiqirstn 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          attlpvqrhprslfpefselfaafpsfaglrptfdtrlmrledemkegryevraelpgvd 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
Alderson M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tuberculosis antigen fusion protein Mtb39A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA
                                                                                               98US-0056556
98US-0223040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       25;
                                                                                                                                                                       99WO-US07717
                                                                                                                                                                                                                                                                                                                                            /note=
238..3
                                                                                                                                                                                                                                                                                                                                                                                         /note= "ERD14"
154..235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "Met/His tag"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98.2%;
98.6%;
                                                                                                                                                                                                                                                                                                                                               . 331
                                                                                                                                                                                                                                                                                                                                                                "DPV"
                                                                                                                                                                                                                                                                                                                      "MTI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       English
Campos-Neto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 718; DB 20;
Pred. No. 2.1e-73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
Y32069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      using a vector carrying a polynucleotide (see Z2015) comprising the 3 coding sequences for the antigens. The invention provides fusion proteins (see Y20059-71) containing at least 2 M. tuberculosis antigens. The new fusion proteins and polynucleotides encoding them are useful as vaccines for preventing tuberculosis (claimed), for diagnosis (via in vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of disease progression, and treatment of tuberculosis. They are more effective immunogens than mixtures of the individual protein
07-APR-1999;
                                               14-OCT-1999
                                                                                                                                                                     Protein
                                                                                                                                                                                                                    Protein
                                                                                                                                                                                                                                                                 Protein
                                                                                                                                                                                                                                                                                                                                          Key
                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                    diagnosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tuberculosis; antigen; fusion protein; Mtb36f; ERD14; DPV; MTI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Y32069 standard; Protein; 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              New fusion proteins useful for diagnosis, prevention and treatment tuberculosis -  \\
                                                                                               WO9951748-A2
                                                                                                                                                                                                                                                                                                                 Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            17-JAN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ERD14, DPV and MTI.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This sequence represents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 1; Fig 2; 83pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tri-antigen fusion protein,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 1999-601610/51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121 LTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9\ {\tt attlpvqrhprslfpefselfaafpsfaglrptfdtrlmrledemkegryevrael.} pgvd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ltvsvavsegkptekhiqirstn 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                    therapy; vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tuberculosis antigen fusion protein Mtb36f
99WO-US07717.
                                                                                                                                                                                                                  /note= "ERD14"
154..235
                                                                                                                                                                                      /note= "DPV"
                                                                                                                                                                                                                                                                                          /note= "Met/His tag
                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                     ..368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98.2%;
98.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The fusion protein is expressed in host cells
                                                                                                                                                 "MTI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a recombinant Mycobacterium tuberculosis in, termed Mtb39A, composed of the antigens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 718; DB 2
Pred. No. 7e-73;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                    immunogen
```

DB 20; 2;

Length 331; Indels

0,:

Gaps

0;

68

RESULT Y32060

В Ş В Ωy 밁 γQ

```
RESULT
Y32065
                                                                                                                                                                                                                                                                                                                                                                                                                                88888888888888
                                                                                                                                                                                                                                                                            γ
                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                  Qy
  뮍
                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ij
                                                                                                                                                                                                                                                                                                                                                                              Matches 141;
                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                           This sequence represents a recombinant Mycobacterium tuberculosis tri-antigen fusion protein, termed Mtb36f, composed of the antigens ERD14, DPV and MTI. The fusion protein is expressed in host cells using a vector carrying a polynucleotide (see Z20204) comprising the coding sequences for the 3 antigens. The invention provides fusion proteins (see Y32059-71) containing at least 2 M. tuberculosis antigens. The new fusion proteins and polynucleotides encoding them are useful as vaccines for preventing tuberculosis (claimed), for diagnosis (via in vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of disease progression, and treatment of tuberculosis. They are more effective immunogens than mixtures of the individual protein
                                                                                                                     Tuberculosis; antigen; fusion protein; Mtb46f; ERD14; DPV; MTI;
                                                                                          Mycobacterium
                                                                                                            MSL; diagnosis; therapy; vaccine;
                                                                                                                                          Mycobacterium
                                                                                                                                                            17-JAN-2000 (first entry)
                                                                                                                                                                                    Y32065
                                                                                                                                                                                                       Y32065 standard; Protein; 433
                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 1; Fig 11A-B; 83pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 1999-601610/51
N-PSDB; Z20204.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Skeiky YAW, Alderson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      07-APR-1998;
30-DEC-1998;
 Protein
                    Protein
                                        Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New fusion proteins useful for diagnosis, prevention and treatment of tuberculosis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (CORI-) CORIXA CORP.
                                                           Peptide
                                                                                                                                                                                                                                                         130
                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                       61 PDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDIKATYDKGI 120
                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                70
                                                                                                                                                                                                                                                                                                                                       10
                                                                                                                                                                                                                                                                                                                                                1 ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD
                                                                                                                                                                                                                                                      LTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                      attlpvqrhprslfpefselfaafpsfaglrptfdtrlmrledemkegryevraelpgvd
                                                                                                                                                                                                                                                                                               pdkdvdimvrdgqltikaerteqkdfdgrsefaygsfvrtvslpvgadeddikatydkgi
                                                                                                                                                                                                                                                                                                                                                                                                                                 368 AA;
                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                          tuberculosis
                                                                                                                                        tuberculosis antigen fusion protein Mtb46f.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98US-0056556
98US-0223040
/note= "ERD14"
155..236
/note= "DPV"
239..332
                                                /note= "Met/His tag"
                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                         98.2%;
98.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ĭ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Campos-Neto A;
                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                         152
                                                                                                                                                                                                                                                                                                                                                                                        Score 718; DB 20;
Pred. No. 8.2e-73;
                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                            immunogen
                                                                                                                                                                                                                                                                                                                                                                                                  Length 368;
                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                      69
                                                                                                                                                                                                                                                                                                                                                                               0,
                                                                                                                     RESULT
Y32064
                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                            Дβ
 Вb
                                                                                                                                                                               2
                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                      Mycobacterium tuberculosis
```

```
Query Match
Best Local s
Matches 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         host cells using a vector carrying a polynucleotide (see Z20200) comprising the coding sequences for the 4 antigens. The invention provides fusion proteins (see Y32059-71) containing at least 2 M. tuberculosis antigens. The new fusion proteins and polynucleotides encoding them are useful as vaccines for preventing tuberculosis (claimed), for diagnosis (via in vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of disease progression, and treatment of tuberculosis. They are more effective immunogens than mixtures of the individual protein
                                                                                                                                                               Y32064;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This sequence represents a recombinant Mycobacterium tuberculosis tetra-antigen fusion protein, termed Mtb46f, composed of the antiquent tetra-antigen fusion protein termed Mtb46f, composed of the antiquent tetra-antigen fusion protein is expressed in the fusion protein is expressed in the fusion protein is expressed in the fusion protein is expressed in the fusion protein is expressed in the fusion protein is expressed in the fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim 1; Fig 7A-B;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Skeiky YAW, Alderson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    07-APR-1998;
30-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein
                                                                     Mycobacterium
                                                                                                                 17-JAN-2000
                                                                                                                                                                                                            Y32064 standard; Protein; 856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New fusion proteins useful for diagnosis, prevention and treatment of tuberculosis -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 1999-601610/51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        07-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (CORI-) CORIXA CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO9951748-A2
                                                                                                                                                                                                                                                                                                                      130 ltvsvavsegkptekhiqirstn 152
                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                         70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD 60
                                                                                                                                                                                                                                                          5
mTCC2; diagnosis; therapy;
                                                                                                                                                                                                                                                                                                                                                                                                                    LTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                              (first entry)
                                                                   tuberculosis antigen fusion protein Mtb88f.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98US-0056556
98US-0223040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     99WO-US07717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "MTI"
335..433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    83pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98.2%;
98.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "MSL"
                          fusion protein; Mtb88f; ERD14; DPV; MTI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Campos-Neto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 718; DB Pred. No. 1e-7 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 No. 1e-72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 433;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69
```

0

vaccine; immunogen

```
RESULT
R12489
                                                                                 Ş
                                                                                                        Ъ
                                                                                                                            Qy
'n
                                                              밁
                                                                                                                                                   뫄
                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                      So
                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                  Matches
      R12489
                                                                                                                                                                                                                                                                                             This sequence represents a recombinant Mycobacterium tuberculosis penta-antigen fusion protein, termed Mtb881, composed of the antigens ERD14, DPV, MTI. MSI and MTTC2. The fusion protein is expressed in host cells using a vector carrying a polynucleotide (see Z20199) comprising the coding sequences for the 5 antigens. The invention provides fusion proteins (see Y2059-71) containing at least 2 M. tuberculosis antigens. The new fusion proteins and polynucleotides encoding them are useful as vaccines for preventing tuberculosis (claimed), for diagnosis (via in vitro assays or intradermal skin tests for detection of anti-M. tuberculosis antibodies), monitoring of diagnose progression, and treatment of tuberculosis. They are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Key
Peptide
                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     07-APR-1998;
30-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 1; Fig 6A-B;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  New fusion proteins useful for diagnosis, prevention and treatment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       07-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14-OCT-1999.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO9951748-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (CORI-) CORIXA CORP
                                                              130
                                                                                   121
                                                                                                                               61
                                                                                                         70
                                                                                                                                                    10
                             6
                                                                                                       ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD 60
                                                                                  LTVSVAVSEGKPTEKHIQIRSTN 143
                                                                                                                                                                                                                                                                                     effective immunogens than mixtures of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1999-601610/51
                                                              ltvsvavsegkptekhigirstn
     standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YAW,
                                                                                                                                                                                                                                                       856
                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Alderson
                                                                                                                                                                                                                                                       AΑ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98US-0056556
98US-0223040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       99WO-US07717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note=
335..43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note-
239..3
     protein; 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 434..856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "ERD14"
155..236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           335..431
/note= "MSL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note= "Met/His tag"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                 83pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ..332
                                                                                                                                                                                                           98.2%;
98.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ż
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "ITM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "mTTC2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "DPV"
                                                                                                                                                                                                                                                                                                                                                                                                                                  English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Campos - Neto
                                                                                                                                                                                               Score 718; DB Pred. No. 2.8e 0; Mismatches
                                                                                                                                                                                                0;
                                                              152
                                                                                                                                                                                                           DB 20;
1.8e-72;
                                                                                                                                                                                                                                                                                     individual protein
                                                                                                                                                                                                                     Length 856;
                                                                                                                                                                                                Indels
                                                                                                                                                                                               0;
                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of.
                                                                                                                                                                                               0;
```

```
Š
                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                             Matches
Majorly abundant extracellular product; MAP; M.tuberculosis; immunise; vaccinating agent; vaccine; M.bovis; M.marinum; M.kansasii; M.aviumintracellulare; M.fortuitum; M.chelonei; M.scrofulaceum; M.leprae; M.africanum; M.ulcerans; M.microti; human; cat; dog;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 The peptide and fragments thereof may be used in diagnosis, therapy and prophylaxis of human and experimental tuberculosis. The product is lymphoproliferative and may thus be used to stimulate human periferal blood lymphocytes for experimental use, and in the production of cellular growth and differentiation factors, and treatment of cancer by non-specifically boosting cellular immunity.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                New protein and peptide(s) from Mycobacterium tuberculosis -early detection of tuberculosis and for treating tuberculosis related inflammation by T-cell proliferation.
                                                               12 kD M.tuberculosis extracellular protein N-terminal
                                                                                                                                           R85672 standard; peptide; 48
                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1991-187585/26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22-DEC-1989;
27-MAR-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Jagannath C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    17-DEC-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            26-JUN-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobaterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Tuberculosis; vaccine; lymphoproliferative;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10-SEP-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R12489;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (ASTR ) ASTRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Peptide derived
                                                                                                                                                                                                                                  113 KATYDK---
                                                                                                                                                                                                                                                          58 ---lp-----
                                                                                                                                                                                                        91 ratydkryevrdfdgraelpgvdpdcdvcitrgiltvsvcv 131
                                                                                                                                                                                                                                                                                    53
                                                                                                                                                                                                                                                                                                                                    1 ATTLPVQRHPRSLFPEFSELFAAFPSFAGLRPTFDTR-LMR------LEDEMKEGRYEV 52
                                                                                                                                                                                                                                                                      RAELPGVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRTVSLPVGADEDDI 112
                                                                                                                                                                                                                                                                                                          99;
                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                           131 AA;
                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Balganesh M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ΑВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               89IN-0000938
90SE-0001105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    90GB-0027267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          from and antigenic to Mycobacterium tuberculosis
                                                                                                                                                                                                                                                          ·--vakhgel---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35pp;
                                                                                                                                                                                                                                                                                                                                                                         48.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         English
                                                                                                                                                                                                                                                                                                                                                             4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Srinivasa
                                                                                                                                                                                                                                                                                                                                                                        Score 356; DB 12;
Pred. No. 1.1e-32;
                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                      -GILTVSVAV 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BR;
                                                                                                                                                                                                                                                          -rsefaygsfvrtvslpvgadeddi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     South Indian Isolate
                                                                                                                                                                                                                                                                                                                                                             4.
                                                                                                                                                                                                                                                                                                                                                                                    Length 131;
                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                             64;
                                                                                                                             - -
                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIII.
                                                                                                                                                                                                                                                                                                            57
                                                                                                                                                                                                                                                              90
```

```
RESULT
R92889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              XX PR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PD OS XXX
                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tuberculosis. These proteins constitute approx. 90% of all of the proteins released by M.tuberculosis in culture. The MAPs can be used to immunise a host animal, and due to their release from M. tuberculosis when it infects the host, they are presented to the host immune system at high frequency. Due to their profuse and continual presentation to the infected host's immune system, the most prevalent bacterial extracellular products provoke a vigorous immune response largely irrespective of their individual molecular immunogenic characteristics. These peptides may be used in a vaccinating agent to provide immunity against M.tuberculosis, M.bovis, M.marinum, M.kansasii, M.aviumintracellulare, M.fortuitum, M.chelonei, M. acrofilacoum. M.leprae. M.africanum. M.ulcerans, and M.marioroti in
                                                                             N-terminal peptide; extracellular product; Mycobacterium; 1: immunoreactive; vaccine; immune response; pathogen; mammal; opsonising humoral response; intracellular bacteria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       used
                                                                                                                                                                                                                       R92889 standard; peptide; 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The sequences
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          such as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12-AUG-1994;
23-NOV-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18-NOV-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cattle;
22-FEB-1996
                           WO9605223-A1
                                                      Mycobacterium
                                                                                                                                      Mycobacterium
                                                                                                                                                                  30-SEP-1996
                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1995-206898/27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Horwitz MA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (REGC ) UNIV CALIFORNIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .scrofulaceum,
                                                                                                                                                                                                                                                                                                                        34
                                                                                                                                                                                                                                                                                                                                                    Local Similarity es 47; Conserv
                                                                                                                                                                                                                                                                                              _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       င်
                                                                                                                                                                                                                                                                                           FDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERT 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            19; Page 105; 123pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    uences given in R85672-79 represent N-terminal peptides from abundant extracellular products (MAPs) produced by M. losis. These proteins constitute approx. 90% of all of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                     cats,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       promote immune response to various Mycobacterium pathogens, M. tuberculosis, M. bovis, M. leprae, etc. in humans,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sheep, etc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   composed of major extracellular prods. of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sheep;
                                                                                                                                                                                                                                                                                                                                                                                                                         48
                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                  (first entry)
                                                                                                                                     12 kD protein N-terminal peptide
                                                                                                                                                                                                                                                                                                                                                                                                                          AΑ
                                                      tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                     dogs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           horse;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94US-0289667
93US-0156358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94WO-US13145
                                                                                                                                                                                                                                                                                                                                                                                                                                                   M.leprae, M.africanum, M.ulcerans, and M.microti in ogs, cattle, sheep, horses and pigs.
                                                                                                                                                                                                                                                                                                                                                              32.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         pig.
                                                                                                                                                                                                                                                                                                                                                    0,
                                                                                                                                                                                                                          A
                                                                                                                                                                                                                                                                                                                                                                Score 238;
Pred. No. 5.
                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                DB 16;
                                                                                                                                                                                                                                                                                                                                                                             Length 48
                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                              48
                                                                                                           12
                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                           kD protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   from
                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                    0
```

```
RESULT
W18183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       extracellular products of Mycobacterium. This sequence represents the CC N-terminus of the 12 kD protein of M. tuberculosis. The 12 kD protein, CC or an immunoreactive homologue or a fragment of it, with this sequence as the N-terminus can be used in a vaccinating agent of the invention. The CC vaccinating agent promotes an immune response against a Mycobacterium CC pathogen, and are therefore useful for immunising a mammal against one of CC these pathogens. As the vaccines do not contain whole bacteria or CC components, they are less likely to provoke toxic responses compared to CC attenuated or killed bacterial vaccines. Also, the vaccines are not CC iffe-threatening to immunocompromised individuals. The use of CC extracellular products also prevents the development of an opsonising CC humoral response which can increase the pathogenesis of intracellular cCC precludes the use of widely used screening and control techniques based contains the use of widely used screening and control techniques based contains the use of widely used screening and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based contains and control techniques based control techniques based control techniques based control techniques based control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control techniques control te
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                        06-DEC-1995;
23-MAY-1995;
20-OCT-1995;
31-OCT-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 62; Page 110; 138pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Vaccines comprising abundant extracellular prods. - useful to vaccinate against intracellular bacteria, partic. Mycobacterium
                                                                                                                                                                                               28-NOV-1996.
                                                                                                                                                                                                                                        WO9637219-A1
                                                                                                                                                                                                                                                                                Mycobacterium
                                                                                                                                                                                                                                                                                                                            Virus;
                                                                                                                                                                                                                                                                                                                                                  Vaccine;
                                                                                                                                                                                                                                                                                                                                                                                         N-terminal sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                       13-AUG-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  W18183;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           W18183 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           on host recognition of immunogenic agents.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R92876-R92889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tuberculosis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 1996-139640/14.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Horwitz
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (REGC ) UNIV CALIFORNIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      24-FEB-1995;
                                                                                                                                                   23-MAY-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          34 FDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERT 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fdtrlmrledemkegryevraelpgvdpdkdvdimvrdggltikaert 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 Similarity
47; Conserv
                                                                                                                                                                                                                                                                                                                         fungus;
                                                                                                                                                                                                                                                                                                                                                vaccinating agent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            represent N-terminal fragments
                                                                                                                                                                                                                                                                                   tuberculosis
                                        95US-0568357.
95US-0447398.
95US-0545926.
95US-0551149.
                                                                                                                                                                                                                                                                                                                       protozoan; HIV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9405-0289667
                                                                                                                                                   96WO-US07781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      95WO-US02373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        peptide; 48
                                                                                                                                                                                                                                                                                                                                                                                         from Mycobacterium tuberculosis 12KD protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              32.6%;
97.9%;
                                                                                                                                                                                                                                                                                                                                                M.tuberculosis; pathogen; bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 238; DB 17;
Pred. No. 5.3e-20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pred. No. 5.3
); Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nts of the abundant
This sequence represents the
erculosis. The 12 kD protein,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
```

0;

(REGC) UNIV CALIFORNIA

```
₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches . 47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protect against (or to treat existing) infections by Mycobacterium (especially M.tuberculosis) while the epitopes can also be used to detect presence of an immune response to a Mycobacterium pathogen. The vectors, containing the DNA for the extracellular proteins, are used to transform cells for production of recombinant DNA molecules. More generally the DNA from other pathogens can be used in vaccines, e.g. against other bacteria, viruses, fungi and protozoa. Since different combinations of DNA can be used, a wide range of effective compositions can be produced. They generate a response against the antigens most often found on infected cells during the infection, regardless of the strength or specificity of the immune response. The vaccines are easy to produce and less toxic than known killed or attenuated vaccines, so can be given to immunocompromised subjects, e.g. those with HIV infection.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       immunodominant epitope of at least one majorly abundant extracellular protein, i.e. the M.tubbrculosis 110, 80, 71, 58, 45, 328, 30, 24, 23.5, 23, 16, 14 or 12 kD proteins, or their analogues, homologues and subunits. The present sequence represents the N-terminal amino acid sequence of the 12 kD protein. The N-terminal amino acid sequences of the major abundant extracellular products were
                                                       21-JAN-1997;
                                                                                            15-JAN-1998;
                                                                                                                                                                                                                Mycobacterium tuberculosis
                                                                                                                                                                                                                                                     opsonising humoral response;
                                                                                                                                                                                                                                                                        Mycobacterium tuberculosis; vaccination; extracellular product; immunodominant epitope; interleukin-12; MF59; immune response;
                                                                                                                                                                                                                                                                                                                                 M. tuberculosis 12 kD extracellular product N-terminal sequence
                                                                                                                                                                                                                                                                                                                                                                             23-OCT-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                       W75570 standard; protein; 48
            (REGC ) UNIV CALIFORNIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  determined to provide structural data and to uncover possible relationships between the proteins. The vaccinating agents are used to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Vaccines derived from M.tuberculosis major abundant extracellular proteins - are easy to prepare and less toxic than conventional killed or attenuated vaccines, useful for protecting against or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A vaccinating agent for promoting an immune response in a mammal against Mycobacterium pathogens comprises at least one
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Example 2; Page 107; 193pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Harth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              treating Mycobacterial infections
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34 FOTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERT 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 fdtrlmrledemkegryevraelpgvdpdkdvdimvrdgqltikaert 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                     97US-0786533
                                                                                            98WO-US00942
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         32.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 238;
Pred. No. 5.
                                                                                                                                                                                                                                                       intracellular pathogen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 18;
5.3e-20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0
```

```
XEXT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
Matches 47; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         one of the major abundant extracellular 110, 80, 71, 58, 45, 32A, 32B, 30, 24, 23.5, 23, 16, 14 or 12 kDa proteins of M. tuberculosis, or at least 1 of their immunodominant epitopes and interleukin-12 (IL-12) or MF59 as adjuvants. The agent containing the nucleic acid encoding the extracellular products are used to raise a protective or therapeutic immune response against Mycobacterium, specifically M. tuberculosis. The immunodominant epitopes can also be used (typically in a cutaneous hypersensitivity test) to detect an immune response to vaccination. Preparation of the agent does not require selection of the most immunogenic products, so large scale production and purification are easy, resulting in a consistent, standardised formulation, having lower toxicity than killed or attenuated vaccines. The agents provide a rapid
Promoter of aspergillus used to produce animal protein sequence of 4\,80 base pairs
                                                        WPI; 1993-364289/46
N-PSDB; Q51347.
                                                                                                                                                                                                                                                                                                                                                                                                     c424 gene product
                                                                                                                                                                                                                                                                                                                                                                                                                                               16-MAY-1994 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R43654 standard; Protein; 181 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                toxicity than killed or attenuated vaccines. The agents provide a rapid and effective response (including a strong cell-mediated component) and are safe even in immunocompromised subjects. They prevent development of an opsonising humoral response that might spread intracellular pathogens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequences shown in W75570 to W75586 represent N-terminal amino acid sequences of 14 exemplary major abundant extracellular products of Mycobacterium tuberculosis. The invention provides an agent for vaccinating mammals against Mycobacterium. The agent comprises at 10 one of the major abundant extracellular 110, 80, 71, 58, 45, 32A, 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Vaccines against Mycobacterium containing major extracellular proteins - used to, e.g. induce protective and therapeutic im responses, and for detecting an immune response
                                                                                                                                                            30-MAR-1992;
                                                                                                                                                                                                                                                                                                                        Aspergillus nidulans FGSC No. A89
                                                                                                                                                                                                                                                                                                                                                                  Production; high levels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         R43654;
                                                                                                                                                                                                   30-MAR-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                    (MEIP ) MEIJI MILK PROD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Harth G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34 FDTRLMRLEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 fdtrlmrledemkegryevraelpgvdpdkdvdimvrdgqltikaert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Horwitz MA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Page 35; 236pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               48 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                            92JP-0074092
                                                                                                                                                                                                     92JP-0074092
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                32.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 238; DB 19;
Pred. No. 5.3e-20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                immune
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
```

0;

```
RESULT
P50065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SX CC XX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
Matches 47; Conserv
 DNA encoding soybean heat shock protein gene hs6871 is inserted into a T-DNA fragment of A Ti plasmid from Agrobacterium and used in recombinant plasmid which also comprises a vector and opt. a structural gene under the control of the soybean DNA. The vector is esp. DBR322 and the structural gene is, eg the Z gene encoding beta galactosidase, or an endotoxin gene, or it is a soybean gene, eg for herbicide resistance. The new plasmid can be used to control prodn. (from the structural gene) of crystalline endotoxin (esp. from Bacillus thuringlensis) or to introduce resistance to herbicides or pathogens. The structural gene can also be used to recognise plant
                                                                                                                                               Disclosure; Fig. 4; 47pp; English.
                                                                                                                                                                       Recombinant plasmid contg. plant DNA - controlling expression of heat shock gene, inserted into tumour inducing plasmid of agrobacterium.
                                                                                                                                                                                                                              WPI; 1985-271444/44.
                                                                                                                                                                                                                                                                                                                                                                                       EP159884-A.
                                                                                                                                                                                                                                                                                                                                                                                                                 Glycine max
                                                                                                                                                                                                                                                                                                                                                                                                                                           Soybean;
                                                                                                                                                                                                                N-PSDB; N50077.
                                                                                                                                                                                                                                                       Key JL,
                                                                                                                                                                                                                                                                                                          13-APR-1984;
                                                                                                                                                                                                                                                                                                                                    12-APR-1985;
                                                                                                                                                                                                                                                                                                                                                              30-OCT-1985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Soybean heat shock protein hs6871.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12-NOV-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P50065;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P50065 standard; protein; 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The sequence is that encoded by the c424 gene which was isolated from an Aspergillus nidulans cDNA library.
                                                                                                                                                                                                                                                                               (AGRI-) AGRIGENETICS RESEARCH ASSOCIATES LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Example;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  180 iq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PDKDVHIMVRDGQ-LTIKA-----ERTEQKDLDGR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dfaplfrllddydnhrsarghasvqsfa---prfdvr----esnea-yhldgelpgi- 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EFSELF - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----SEFAYGSFVRTVSLPVGADEDDIKATYDKGILTVSVAVSEGKPTEKHIQ 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \verb|pqsnidie| ftdpqtlvik| grserey hsssddnkndqadten qarges sevaktgek qvst
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                           heat
                                                                                                                                                                                                                                                       Gurley
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Page 5-6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                          shock
                                                                                                                                                                                                                                                                                                          84US-0599993
                                                                                                                                                                                                                                                                                                                                    85EP-0302593
                                                                                                                                                                                                                                                       WB,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8pp; Japanese
                                                                                                                                                                                                                                                                                                                                                                                                                                          protein gene hs6871; plasmid; herbicide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        15.5%;
25.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----AAFPSFAGLRPTFDTRLMRLEDEMKEGRYEVRAELPGVD 60
                                                                                                                                                                                                                                                     Nagao
                                                                                                                                                                                                                                                     RT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 113.5; DB 1
Pred. No. 3.8e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                     Schoeffi F,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               46;
                                                                                                                                                                                                                                                       Czarnecka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
recognise
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                     Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9;
```

```
RESULT
P50066
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SS XX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity
                                 DNA encoding soybean heat shock protein gene pE2019 is inserted into a T-DNA fragment of A Ti plasmid from Agrobacterium and used in recombinant plasmid which also comprises a vector and opt. a structural gene under the control of the soybean DNA. The vector is esp. pBR322 and the structural gene is, eg the Z gene encoding beta galactosidase, or an endotoxin gene, or it is a soybean gene, eg for herbicide resistance. The new plasmid can be used to control prodn. (from the structural gene) of crystalline endotoxin (esp. from Bacillus thuringiensis) or to introduce resistance to herbicides or pathogens. The structural gene can also be used to recognise plant calls which have been transferred with means.
Sequence
                  pathogens. The structorells which have been
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Glycine max
                                                                                                                                                                                                                                                                                                                                                   13-APR-1984;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             P50066 standard;
                                                                                                                                                                                   Disclosure; Fig. 1; 47pp; English.
                                                                                                                                                                                                               shock gene,
                                                                                                                                                                                                                                                        N-PSDB; N50070
                                                                                                                                                                                                                                                                   WPI; 1985-271444/44
                                                                                                                                                                                                                                                                                             Key JL,
                                                                                                                                                                                                                                                                                                                                                                             12-APR-1985;
                                                                                                                                                                                                                                                                                                                                                                                                        30-OCT-1985
                                                                                                                                                                                                                                                                                                                                                                                                                                 EP159884-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Soybean; heat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Soybean heat shock protein pE2019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12-NOV-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cells which have been transformed with T-DNA
                                                                                                                                                                                                                         Recombinant
                                                                                                                                                                                                                                                                                                                     (AGRI-) AGRIGENETICS RESEARCH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            112 frlpenakvdevkasmengvltvtvpkeeikkpdvkaidi 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101 VSLPVGADEDDIKATYDKGILTVSVAVSE-GKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tpeahvfkadipglkke-evkleigdgrvlqisgernvekedkndtwhrverssrklvrr 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SLFPEFSELFAAFPSFAGLRPT-FDTRLMRLEDEMKE-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         --GRYEVRAELPGVDPDKDVHIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRT 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     slipsf-----fggrrssvfdpfsldvwdpfkdfhvpsslsaensafvstrvdwke
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           44;
                                                                                                                                                                                                                                                                                            Gurley WB,
 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               153
                                                                                                                                                                                                            plasmid contg. plant {\tt DNA} - controlling expression of heat inserted into tumour inducing plasmid of agrobacterium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   shock protein gene pE2019; plasmid; herbicide;
 ΑA,
                                                                                                                                                                                                                                                                                                                                                 84US-0599993
                                                                                                                                                                                                                                                                                                                                                                             85EP-0302593
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15.2%;
                                                                                                                                                                                                                                                                                             Nagao
                          transformed with T-DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             154
                                                                                                                                                                                                                                                                                            RT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score
Pred.
                                                                                                                                                                                                                                                                                                                     ASSOCIATES LTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                             Schoeffi F,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       111; DB 6;
No. 5.6e-05;
                                                                                                                                                                                                                                                                                             Czarnecka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 153;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                             Œ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                           for
                                                                                                                                              Ë
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               47
                                                                                                                                              ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7;
```

Query Match Best Local Similarity

14.3%;

Score Pred.

104.5; DB 6 No. 0.00031;

6

Length 154;

밁

91

lvlgenldterilasyqegvlklsipvaerakp 123

```
δÃ
                                망
                                                 Š
                                                                                                                         SOXCCCCXXXX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT
P90455
                                                                                                                                                                                                                                                                     DR PAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              XGXGX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                     Query Match
Best Local S
Matches 29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                          Key
Region
Region
Region
Region
Region
                                                                                                                                           The protein and its specified subunits (featured below) can be used for the diagnosis of leprosy and in vaccines. It is recognised by L5 antibody at amino acids 101-116, esp. 109-114
                                                                                                                                                                                                                 Recombinant protein antigens of Mycobacterium leprae - useful for immunoassay reagents for diagnosis of leprosy and as a vaccine components.
                                                                                                                         Sequence
                                                                                                                                                                                              Claim 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Antigens of Mycobacterium leprae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-NOV-1989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P90455;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                P90455 standard;
          101
                                                                                                                                                                                                                                                                      WPI;
                                                                                                                                                                                                                                                                                         Booth
                                                                                                                                                                                                                                                                                                           (IMMU ) IMMUNEX CORP.
                                                                                                                                                                                                                                                                                                                                 22-DEC-1987;
                                                                                                                                                                                                                                                                                                                                                    21-DEC-1988;
                                                                                                                                                                                                                                                                                                                                                                        29-JUN-1989
                                                                                                                                                                                                                                                                                                                                                                                           W08905825-A
                                                                                                                                                                                                                                                                                                                                                                                                                Region
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     leprosy; subunits
                                                                                                                                                                          18/16.6 kD protein of Mycobacterium leprae (see corresp. N90251).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18/16.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 120 kvnevkasmengvltvtvpkeevkkpdvkaiei 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     108
                               53
                                                   41
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                        LEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRT 100
                                                                                                                                                                                                                                                           1989-206595/28.
DB; N90251.
         VSLPVGADEDDIKATYDKGILTVSVAVSE-GKP 132
                            ldidiernvvtvraerpgvdpdrem-----laaerpr-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RAELPGVDPDKDVHIMVRDGQ-LTIKAERTEQK----DLDGRSEFAYGSFVRTVSLPVGA 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DEDDIKATYDKGILTVSVAVSE-GKPTEKHIQI 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       kadiqglkke-evkvqieddrvlqisgernvekedkndtwhrverssgkftrrfrlpena 119
                                                                                                                                                                                                                                                                                         RJ,
                                                                       29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 31;
                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ð
                                                                                                                                                                                             page 15 and fig 1; 18pp; English
                                                                                                                         148
                                                                                                                                                                                                                                                                                         Harris DP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein;
<del>-</del>
                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                leprae.
                                                                                                                         AA;
                                                                                                                                                                                                                                                                                                                                 87US-0137557
                                                                                                                                                                                                                                                                                                                                                    88WO-US04659
                                                                                                                                                                                                                                                                                                                                                                                                               8..23
131..148
97..112
26..40
79..98
101..116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium leprae; vaccine;
                                                                              13.9%;
31.2%;
                                                                                                                                                                                                                                                                                         Love
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19;
                                                                   Score 101.5; DB 10,
Pred. No. 0.00063;
                                                                                                                                                                                                                                                                                         JM,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                         Watson
                                                                                                                                                                                                                                                                                         ď
                                                                                         DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                36;
                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                        Length
                                                                                         148;
                          gvfnrg 90
                                                                     23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7;
                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4;
```

```
QУ
                                                                                                                                                                                    RESULT 15
R79057
     밁
                                                          Db
                                                                                 Qy
                                                                                                            Query Match 13.9
Best Local Similarity 31.2
Matches 29; Conservative
                                                                                                                                                                                                         Mycobacterium leprae 18 kDa antigen may be expressed in Saccharomyces cerevistae using plasmid pBY48 following linkage of the gene to the glycosylphospatidylinositol anchor. This anchoring technique can provide for the release of the product in a highly specific and selective manner. In addition, the recombinant protein will contain an epitope which can be used in its final purification by immunoaffinity. The protein product can be released by e.g. nitrous deamination or treatment with neutral detergent.
                                                                                                                                                                                                                                                                                                                                                                           Recombinant prodn. of proteins, e.g. insulin - by producing the protein with a glycosyl:phosphatidyl:inositol anchor followed by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPI; glycosylphophatidylinositol; antigen; solubilization; Saccharomyces cerevisiae; anchor; Gasl; plasmid pBY48.
                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                   Disclosure; Fig.4; 51pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                      N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gomes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Amaral
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17-FEB-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Glycosylphosphatidylinositol-anchored Mycobacterium leprae antigen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24-JAN-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R79057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R79057
                                                                                                                                                                                                                                                                                                                                                                selective release
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (ESCO-) ESCOLA PAULISTA MEDICINA.
(FINE-) FINEP FINANCIADORA ESTUDOS & PROJETOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-AUG-1995.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WO9522614-A1
     131
                               101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16-FEB-1995;
                                                          93
                                                                                    41
lvlgenldterilasyqegvlklsipvaerakp
                                                                                                                                                                                                                                                                                                                                                                                                                      1995-302720/39
DB; Q99461.
                            VSLPVGADEDDIKATYDKGILTVSVAVSE-GKP 132
                                                       ldidiernvvtvraerpgvdpdrem-----laaerpr--
                                                                                    LEDEMKEGRYEVRAELPGVDPDKDVHIMVRDGQLTIKAERTEQKDLDGRSEFAYGSFVRT 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                             de Amorimfilho
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          de Castilho Valavicius,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard; Protein; 253 AA
                                                                                                                                                                                    253 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             leprae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94BR-0000600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        95WO-BR00010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers 44..129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note=
                                                                                                              13.9%; Score 101.5; DB
31.2%; Pred. No. 0.0014;
Live 16; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "anchor attachment site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Cardoso de Almeida
    163
                                                                                                                                         DB 16;
                                                                                                               25;
                                                                                                               Indels
                                                                                                                                          Length
                                                                                                                                          253;
                                                    gvfnrg 130
                                                                                                               23;
                                                                                                                                                                                                                                                                                                                                                                             þу
                                                                                                               Sque
                                                                                                               \omega
```

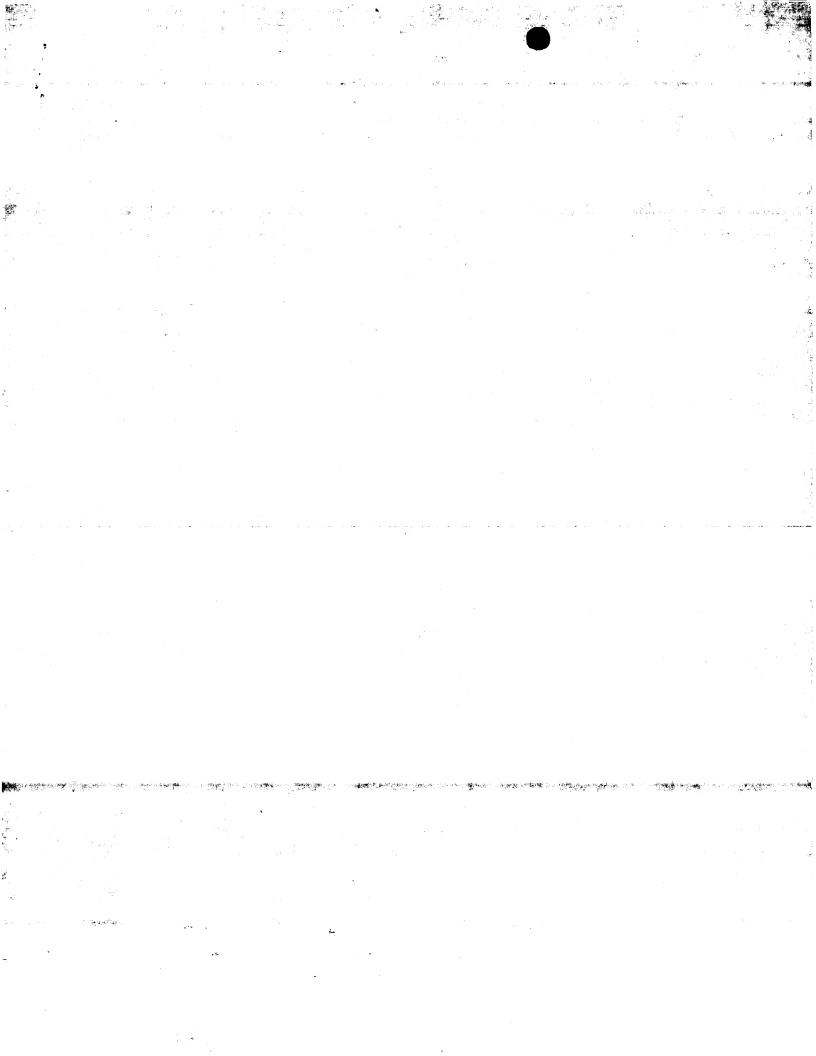
Job time: 202 sec

January

5

2001,

14:26:45



4.5

em_esthum2:*
em_esthum3:*
em_esthum4:*

۲

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                      Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Post-processing: Minimum Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tal number
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nucleic -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB
Bd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nucleic search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             length:
length:
   hits satisfying
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-461-774-9
1161
1 aattcgatgccagt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDENTITY_NUC Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                           EST:*
                                                                                                                                                                                                                                                                                                                                                                                                                                        Listing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7991742 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    January 12,
9b_est10:
9b_est11:
9b_est14:
9b_est14:
9b_est16:
9b_est16:
9b_est16:
9b_est20:
9b_est21:
9b_est21:
9b_est22:
9b_est22:
9b_est24:
9b_est28:
9b_est38:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          aattcgatgccagtcccgcc......gcccgcagtaaaggtttga
                                                                                                                                                                                                                                                                                                                                         gb_est2:*
gb_est4:*
gb_est5:*
gb_est6:*
gb_est6:*
gb_est7:*
                                                                                                                                                                                                                                                                                                                                  gb_est9:*
                                                                                                                                                                                                                                                                                                                                                                                                            gb_est1:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
20000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                        Match
first
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GenCore version (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2001, 18:01:41 ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                         0%
100%
45 ຮເ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3503743858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                         summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (without alignments)
2422.260 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Search time 3358.72 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15983484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1161
```

em_esthum5: *
em_esthum6: *
em_esthum0: *
em_esthum10: *
em_esthum10: *
em_esthum11: *
em_esthum11: *
em_esthum11: *
em_esthum11: *
em_esthum12: *
em_esthum11: *
em_esthum12: *
em_esthum12: *
em_esthum12: *
em_esthum13: *
em_esthum11: *
em_esthum13: *
em_esthum11: *
em_esthum12: *
em_esthum2: *
em_esthum2: *
em_esthum2: *
em_esthum2: *
em_estro1: *
em_estro1: *
em_estro2: *
em_estro1: *
em_estro1: *
em_estro2: *
em_estro1: *
em_estro2: *
em_estro1: *
em_estro2: *
em_estro1: *
em_estro3: *
gb_est44: *
gb_est44: *
gb_est44: *
gb_est45: *
gb_est55: *
gb_est55: *
gb_est69: *
gb_est677: *
gb_est771: *

em_estom1:*
em_estom2:*

```
117; em_cestpl6;*
119 em_cestpl7;*
120 em_estcol4:*
121 em_cestcol4:*
122 em_cestcol5:*
123 em_cestcol5:*
124 em_cestcol6:*
125 em_cestcol6:*
126 em_cestcol6:*
127 em_cestcol6:*
128 em_cestcol6:*
129 em_cestcol6:*
130 em_cestcol6:*
131 em_cestcol6:*
132 em_cestcol6:*
133 em_cestcol6:*
134 em_cestcol6:*
135 em_cestcol6:*
136 em_cestcol6:*
137 em_cestcol6:*
138 em_cestcol6:*
139 em_cestcol6:*
130 em_cestcol6:*
131 em_cestcol6:*
131 em_cestcol6:*
132 em_cestcol6:*
133 em_cestcol6:*
134 em_cestcol6:*
135 em_cestcol6:*
136 em_cestcol6:*
137 em_cestcol6:*
138 em_cestcol6:*
139 em_cestcol6:*
130 em_cestcol6:*
131 em_cestcol6:*
131 em_cestcol6:*
132 em_cestcol6:*
133 em_cestcol6:*
134 em_cestcol6:*
135 em_cestcol6:*
136 em_cestcol6:*
137 em_cestcol6:*
138 em_cestcol6:*
139 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
131 em_cestcol6:*
131 em_cestcol6:*
132 em_cestcol6:*
133 em_cestcol6:*
134 em_cestcol6:*
135 em_cestcol6:*
136 em_cestcol6:*
137 em_cestcol6:*
138 em_cestcol6:*
139 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
131 em_cestcol6:*
131 em_cestcol6:*
132 em_cestcol6:*
133 em_cestcol6:*
134 em_cestcol6:*
135 em_cestcol6:*
136 em_cestcol6:*
137 em_cestcol6:*
138 em_cestcol6:*
139 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
131 em_cestcol6:*
131 em_cestcol6:*
132 em_cestcol6:*
133 em_cestcol6:*
134 em_cestcol6:*
135 em_cestcol6:*
136 em_cestcol6:*
137 em_cestcol6:*
138 em_cestcol6:*
138 em_cestcol6:*
138 em_cestcol6:*
139 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
131 em_cestcol6:*
131 em_cestcol6:*
132 em_cestcol6:*
133 em_cestcol6:*
134 em_cestcol6:*
135 em_cestcol6:*
136 em_cestcol6:*
137 em_cestcol6:*
138 em_cestcol6:*
138 em_cestcol6:*
139 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol6:*
130 em_cestcol
```

190: gb_gss25:*
191: gb_gss26:*
192: gb_gss27:*
193: gb_gss28:*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	NO.	Score	Query Match	Length	DВ	ID	Descr
	-	ω :	ωį	1382	94	AW731194	AW7
O	N	74	15.0	1016	92	CNS03LU9	AL
	- u	лσ.		1000	4	AW/2/499	AW/
	Б	ν. ·		1097		AW731157	AW
	σ,	15		1347	4.	AW731204	AW
	7	4		1711		AW731135	Ah
	8			1338	•	AW731160	AI
C	9	14	٠	1509	æ	BE455283	
	10	147.8	12.7	1315		AW731134	A
C	; <u>-</u>	10		1207	0	AZ183/95	•
	2 7	6. 4		1292		AW727529	· >
	- L	46.		1307		AW/31210	> >
	15 4	145.8		1101		CNS0153F	>
	16	G (1618		AW727506	₽
	17	45.	٠	1411		AW731189	٨
	18	5.	٠	1303		AW727501	A
	2 4	4.		050 060		AW/2/52/	2 A
	21	143.8	12.4	1468		AW731223	Ą
O	22	14		1363		AW731198	AV
	23	40.	٠	1006		BE034822	m
	24	40.		1126		AW731180	AF
	25	0.		1086		AW727532	Al
C	26	39		821		AQ893474	
	27	2 1		1049		AW727475	A
	28	138.4		1397		AW727486	A
	2 6	با د		1674		AW/2/502	A A
	ωí	7:		1262		AW727556	Α:
C	32	7 :		1328		BE455227	:
	ü	7		1501		AW731188	А
	3 4 7	137.2	11.8	1622	94	AW731133	• >
	א ת מית	nσ	<u>-</u> :-	1141		AW/2/555	> 2
	77	σ.		1519		AW731138	0 ہم
-	38	<u>ه</u> :	۱	1188		BE455091	:
C	39	5		918		AQ895329	1
	40	٠.		1158		AW727550	AW
	41	13	1.	915		AZ195437	Α
	42	ω	-	1210		AW731144	AW.
C	43	ω	1.	1080	108	551	BE455154
	44	•	1.	1081	94	748	AW7
	•		•	,		ı	AW7

ALIGNMENTS

RESULT 1
AW731194
LOCUS
DEFINITION
ACCESSION
VERSION
KEYWORDS
SOURCE

Gossypium arboreum.

AW731194 1382 bp mRNA EST 20-APR-2000 GA_E30010K03 Gossypium arboreum 7-10 dpa fiber library Gossypium arboreum cDNA clone GA_E30010K03, mRNA sequence.

AW731194 AW731194 GI:7628853

```
δõ
                                                                                                                                                                                                Š
                                                                                                                                                                                                                       дb
                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
AUTHORS
TITLE
                              δõ
                                                     밁
                                                                       δõ
                                                                                              Db
                                                                                                              Q
                                                                                                                                      망
                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                 В
             밁
                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURES
                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                             609
             725
                                 511
                                                      667
                                                                          451
                                                                                                                  391
                                                                                                                                       549
                                                                                                                                                           331
                                                                                                                                                                                494
                                                                                                                                                                                                    271
                                                                                                                                                                                                                        434
                                                                                                                                                                                                                                            211
                                                                                                                                                                                                                                                                 375
                                                                                                                                                                                                                                                                                    151
                                                                                                                                                                                                                                                                                                          315
                                                                                                                                                                                                                                                                                                                                                   255
                                                                                                                                                                                                                                                                                                                             91
                                                                                                                                                                                                                                                                                                                                                                      31
                       actecgaaccegeeggegeeggeacegeeattggagaacageeegeegeegeegeeg
                                                                                                          acgcctcctttgccgccggtgccgcggggtcgggcgcgagaccggttccggcggtg
                                                                                                                                                                                                                                                                         ccgctgccaccggacccgccgatgccgccggccatttggtccgcactggaggcgccgaac
                                                                                                                                                                                                                                                                                                        cggacgctgtcgccggtaccgccggcggccgccgtcgccgatcagcttggcggccccg
                                                                                                                                                                                                                                                                                                                                                             GCGCTGCAGGCGCTCTGGGCGCGCGCGCGCGCGCGCCCCTCACCGAACCGCGGGC
                                                               ttgccggtgaagatgccgtcgctccggtgccgcgttccctccggccgagccggag
                                                                                             572;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unpublished (2000)
Contact: Wing RA
Clemson University Genomics
Clemson University
100 Jordan Hall, Clemson, SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Leslie, A., Frisch, D., Yu, Y., W
An integrated analysis of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      An integrated analysis of the cotton fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Malvales; Malvaceae; Gossypium.

1 (bases 1 to 1382)
                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               quality sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              864 656 7288
864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                        94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone="GA_Ea0010K03"
/clone_lib="Gossypium arboreum
/tissue_type="Fibers isolated f
dpa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                      /lab_host="E. coli"
/note="Vector: pBK-CMV;
702 c 502 g (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /cultivar="8400"
/db_xref="taxon:29729"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /strain="AKA
                                                                                                                                                                                                                                                                                                                                                                                                    15.8%;
51.3%;
                                                                                                                                                                                                                                                                                                                                                                                          0,
                                                                                                                                                                                                                                                                                                                                                                                                    Score 183.8; DB 9 Pred. No. 2.1e-21;
                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Wood, T.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            arboreum'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               genetics,
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Site_1:
                                                                                                                                                                                                                                                                                                                                                                                          513;
                                                                                                                                                                                                                                                                                                                                                                                                             94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Wing, R.A. and development,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                       EcoRI;
24 othe
                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                       others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bolls
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dpa fiber library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               harvested
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and Wilkins, T.
                                                                                                                                                                                                                                                                                                                                                                                          31,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 evolution
                                                                                                                                      809
                                                                                                                                                                             548
                                                                                                                                                                                                  330
                                                                                                                                                                                                                       493
                                                                                                                                                                                                                                                                                                                            150
                                                    724
                                                                                            666
                                                                                                                 450
                                                                                                                                                         390
                                                                                                                                                                                                                                          270
                                                                                                                                                                                                                                                               433
                                                                                                                                                                                                                                                                                   210
                                                                                                                                                                                                                                                                                                        374
                                                                                                                                                                                                                                                                                                                                                314
                                                                                                                                                                                                                                                                                                                                                                    90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7-10
                                                                                                                                                                                                                                                                                                                                                                                          5
JOURNAL
REFERENCE
AUTHORS
                                                                                 JOURNAL REFERENCE
                                                                                                                                              REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                RESULT 2
CNS03LU9/c
                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                   γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                SOURCE
                                                                                                                                                                                                                                          KEYWORDS
                                                                                                                                                                                                                                                      VERSION
                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                               ACCESSION
                                                                                                                                                                                                                                                                                                        LOCUS
                                         TITLE
                                                                       AUTHORS
                                                                                                                TITLE
                                                                                                                                                                                                                      ORGANISM
                                                                                                                                                                                                                                                                                                                                                           1304
                                                                                                                                                                                                                                                                                                                                                                                                   1244
                                                                                                                                                                                                                                                                                                                                                                                                                                            1184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1124
                                                                                                                                                                                                                                                                                                                                                                                                                       1051
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                              991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                871
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        785
                                                 Roest-Crollius, H., Jaillon, O., Dasilva, C., Bouneau, L., Bernot, A., Fizames, C., Wincker, P., Brottier, P., Quetie Saurin, W. and Weissenbach, J.
                                                                                                                                                                                                                    AL249930.1 GI:7970942
GSS; genome survey sequence.
Tetraodon nigroviridis.
Tetraodon nigroviridis
                                                                      2 (bases 1 to 1016)
Roest-Crollius, H., J
                                                                                                                                             1 (bases 1 to 1016)
Roest-Crollius, H., J
                  Unpublished
                              Tetraodon nigroviridis
                                                                                                     freshwater pufferfish
                                                                                                                Charaterization and
                                                                                                                                   Bouneau, L., Billault, A.,
                                                                                                                                                                                                                                                               AL249930
                                                                                          Unpublished
                                                                                                                           Weissenbach,
         (bases 1
                              gene number estimate provided odon nigroviridis DNA sequence
          ç
                                                                                                                                             Jaillon, O.,
                                                                                                    repeat analysis of the compact sh Tetraodon nigroviridis
```

```
CCCCTCGCTCGGGCGCCGCGCGGCGTGCCCCGGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcggcggcctcagcgctcgcgtacgcgccagcgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cccagcaacagctgggtgggtgttcacaatgttgagcaggccctccaacggcgccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccccgccggcttgcccggtccccggtgcgccgttggcgccgttgccgatcagcggacgc 1050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccggcctggccgggccccggacccgccggccgccgttgccgtacagcagcccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tcaccccgggcccacccgccgcttgccgaatagccccgcggctccacctgggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gagccgaacagcagccggccggccggccggccggccgttgccggggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tegeegeegageeegeetgtgeeggtgtteeegaeteegeeggggeeeeeegggegeegeeg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aagcctggcccgccggcccgccgatgccaccggctccgaacagcccggccgccccgccg'750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleos Actinopterygii; Neopterygii; Teleostei; Euteleostei; Neotele: Eurypterygii; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Holacanthopterygii; Acanthopterygii; Percomorpha; Tetraodontiformes; Tetraodontoidei; Tetraodontidae; Tetraodo
                                                                                                                                                                                                                                                                                                    CNS03LU9 1016 bp DNA GSS 17-MAY-2000
Tetraodon nigroviridis genome survey sequence PUC-Ori end of clone
036F09 of library G from Tetraodon nigroviridis, genomic survey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     on,O., Dasilva,C., Fiza
Quetier,F., Ṣaurin,W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                1339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1146
                                                          Fizames, C.,
                                      Bernot, A.
genome
                                                                                                                                                      Euteleostomi;
; Neoteleostei;
                                                          Fisher,
  of
                                        and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               930
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1063
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         962
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         690
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     902
    the
```

уď

genome

wide analysis Quetier,F

using

Fisher

'n

```
日
                   δÃ
                                          В
                                                            QΥ
                                                                                    밁
                                                                                                      QΥ
                                                                                                                             망
                                                                                                                                               Š
                                                                                                                                                                      뮍
                                                                                                                                                                                       Qy
                                                                                                                                                                                                               В
                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BASE CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match

Best Local Similarity

Matches 502; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               296
                                                                                                         612
                                                                                                                              476
                                                                                                                                                                                            492
                                                                                                                                                                                                                 596
                                                                                                                                                                                                                                                                             372
                                                                                                                                                                                                                                                                                                   716
                                                                                                                                                                                                                                                                                                                                            776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15
 cageceggeegeegeegeegaegeegeetgtgeeggtgtteeegaeteegee
                                                     cccgccggcgccaccgttgaagcctggcccgccggcccggccgatgccaccggctccgaa
                                                                                               ccggtgccgccggcaccgccggcggccaacacctcgaacagcccgctgcgaccgccggc
                                                                                                                                         cagecegeegeeggtgeeggtgeeaceggtgeeceegttgaegeteaacee
                                                                                                                                                                                   ggtgccgccggtcccgcgttgccggtgaagatgccgccgtcgcctccggtgccgccgtt
                                                                                                                                                                                                                                                                                                             accygttccggcggtgccgccaatgccgccagcgcc---gaagaggatgccggcgttgcc
                                                                                                                                                                                                                                                                                                                                                      accgccgatgccgccgacgcctttgccgccggtgccgccggggtcggggcgcgag
                                                                                                                                                                                                                                                                                                                                                                                               actggaggcgccgaaccctccggtgccccccggcgccgccggaaccgaacagtgcgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gcccgcccgcccgccctcaccgcccacgagttggttagcggtgccagttccgcc
                                                                                                                                                                                                                                                                                                 gctaccggccgcgcccggacgctgtcgccgccggtaccgccggcggcgccgccgtcgccgat 134
                                                                                                                                                                       GCCCCGCCCGCCCGCCCGCCCCGCCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Direct Submission
Submitted (12-APR-2000) to the EMBL/GenBank/DDBJ databases
This sequence is a single read and was generated as part of a law scale clone-end sequencing project of the Tetraodon nigroviridis genome. For more information, please take a look at http://www.genoscope.cns.fr/Tetraodon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PUC-Ori"
a 214 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Tetraodon nigroviridis"
/db_xref="taxon:99883"
/clone="035F09"
/clone=lib="G"
/note="Genoscope sequence ID : COB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15.0%;
49.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 174.6; D
Pred. No. 6.9e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C†
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 192;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         505;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COBG036CC05SP1-end
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1016;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of a large
                                                                                                                                                                                                                                   491
                                                                                                                             417
                                                                                                                                                                       477
                                                                                                                                                                                                               537
                                                                                                                                                                                                                                                                            431
                                                                                                                                                                                                                                                                                                                      371
                                                                                                                                                                                                                                                                                                                                                                                    777
                                                                                                                                                                                                                                                                                                                                                                                                        254
                                                                                                                                                                                                                                                                                                                                                                                                                            837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               957
                    791
                                         297
                                                              731
                                                                                   357
                                                                                                                                                                                                                                                        597
                                                                                                                                                                                                                                                                                                 657
                                                                                                                                                                                                                                                                                                                                                              314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2
Š
```

```
Ъ
                        δÃ
                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
AW727499
                                                                                     Ş
                                                                                                                                                                                              BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                         FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DEFINITION
                                                                                                                    Matches
                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JOURNAL
                                                                                                                                                                                                                                                                                                                                                                           source
                 126 gtcgccgatcagcttggcggccccgccgctgccaccggaccccgccgatgccgatgccat 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    910
176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         792
                                                                                                                                  Local Similarity
                                                                                   66 ggtgccgccgctaccggccgcgcccggacgctgtcgccggcggtaccgccggcggcgcc 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttgccgtacagcccgccggcccggcttgcccggtccccggtgcgcc 1022
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCCGCCCCGCCCCGCCCCGCCCCGCCCGCCCGACCCGACCCGACCCGACCCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cccgcggctccacctgggccgccggcctggccgggcccccggacccgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCCCGGCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  490;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Clemson University Genomics Institute
Clemson University
100 Jordan Hall, Clemson, SC 29634, U.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AW727499 1246 bp mRNA EST 20-API GA__Ea0012K02 Gossypium arboreum 7-10 dpa fiber library arboreum cDNA clone GA__Ea0012K02, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                               Tel: 864 656 7288
Fax: 864 656 4293
Email: rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Leslie,A., Frisch,D., Yu,Y., Wood,T.C., Wing,R.A. and Wilkins,T.A.
An integrated analysis of the genetics, development, and evolution
of the cotton fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gossypium arboreum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Maivales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AW727499.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AW727499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 lvales; Malvaceae; Gossypium.
(bases 1 to 1246)
                                                                                                                                                                                                            49
                                                                                                                                                                                                                                                                                                                                                                                                      quality sequence stop:
                                                                                                                     Conservative
                                                                                                                                                                                                            a
                                                                                                                                                                                                          /lab_host="E. coli"
/note="Vector: pBK-CMV;
828 c 293 g
                                                                                                                                                                                                                                                                /db_xref="taxon:29729"
/clone="GA_Ea0012K02"
/clone_ibb="Gossypium arboreum 7-10 dpa fiber library"
/tissue_type="Fibers isolated from bolls harvested 7-10
                                                                                                                                                                                                                                                                                                                              /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                           /organism="Gossypium
/strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                        Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GI:7625054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1246 bp
                                                                                                                                  14.5%;
                                                                                                             Score 167.8; DB y4, Pred. No. 8.8e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                29634, USA
                                                                                                                                                                                                                                                                                                                                                            arboreum'
                                                                                                                                                                                                          ; Site_1: 57 t
                                                                                                                                               94;
                                                                                                                                                                                                          EcoRI; Si
19 others
                                                                                                                    Indels
                                                                                                                                               Length
                                                                                                                                                                                                                        Site_2:
                                                                                                                                                 1246;
                                                                                                                    11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gossypium
                                                                                                                  Gaps
                                                          355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        57
```

186

ttggtccgcactggaggcgccgaaccctccggtgcccccggcgccgccgggaccgaacag 245

```
REFERENCE
AUTHORS
TITLE
                                                        KEYWORDS
SOURCE
ORGANISM
                                                                                                                        RESULT
AW731227
                                                                                                                                                                       Ωy
                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                     Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                         밁
                                                                                                                                                                                                                                                        Db
                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db
                                                                                  VERSION
                                                                                         ACCESSION
                                                                                                                                                         1189
                                                                                                                                                                                         1129
                                                                                                                                                                                                                         1069
                                                                                                                                                                                                                                                        1009
                                                                                                                                                                                                        902
                                                                                                                                                                                                                                                                         783
                                                                                                                                                                                                                                                                                         949
                                                                                                                                                                                                                                                                                                         724
                                                                                                                                                                                                                                                                                                                         889
                                                                                                                                                                                                                                                                                                                                       664
                                                                                                                                                                                                                                                                                                                                                        829
                                                                                                                                                                                                                                                                                                                                                                        604
                                                                                                                                                                                                                                                                                                                                                                                        776
                                                                                                                                                                                                                                                                                                                                                                                                       544
                                                                                                                                                                                                                                                                                                                                                                                                                       716
                                                                                                                                                                                                                                                                                                                                                                                                                                       484
                                                                                                                                                                                                                                                                                                                                                                                                                                                       656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       246
                                                                                                                                                                                                                                                                                                                      ccccgccgttgccgtacagcagcccgccggcccggctgcccggtccccg
                                                                                                                                                                                                 gctccgaacagcccggccgc-cccgccgtcgccgccgagcccgcctgtgccggtgttccc
                                                                                                                                                                                                                                                                                                                                                                                       --acececececececececececececececece
                                                                                                                                                                                                                                                                                                                                                                                               ttggagaacagcccgccgcccgccggtgccgccggttgcccccgttgacg
                                                                                                                                                                                                                                                                                                                                                                                                                              ccgccgttccctccggccgagccggagactccgaacccgccggcggcgccgccaccgcca
                                                                                                                                                                                        ctcaacccggcggtgccggcggcagcggcggcggcaacacctcgaacagcccgctgcga
                                                                                                                                                                                                                                                                                                                                                                                                                      gttccgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccggggtcggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gossypium arboreum.
Gossypium arboreum.
Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
Malvales; Malvaceae; Gossypium.
1 (bases 1 to 1099)
Leslie,A., Frisch,D., Yu,Y., Wood,T.C., Wing,R.A. and Wilkins,T.A.
An integrated analysis of the genetics, development, and evolution of the cotton fiber
                                                                                       GA_Ea0010021 Gossypium arboreum 7-10 arboreum cDNA clone GA_Ea0010021, mRN AW731227
                                                                                AW731227.1
                                                                                                                1099 bp
                                                                                               mRNA sequence
                                                                                                                                                                                                                                                                                                                                                                                      -cceceeecececcccccc
                                                                                                        dpa fiber library Gossypium
                                                                                                                                                        1242
                                                                                                                                                                        1015
                                                                                                                                                                                        1188
                                                                                                                                                                                                                        1128
                                                                                                                                                                                                                                                                        841
                                                                                                                                                                                                                                                                                        1008
                                                                                                                                                                                                                                                                                                                                                       888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      423
                                                                                                                                                                                                       961
                                                                                                                                                                                                                                       901
                                                                                                                                                                                                                                                                                                         782
                                                                                                                                                                                                                                                                                                                       948
                                                                                                                                                                                                                                                                                                                                       723
                                                                                                                                                                                                                                                                                                                                                                       663
                                                                                                                                                                                                                                                                                                                                                                                       828
                                                                                                                                                                                                                                                                                                                                                                                                      603
                                                                                                                                                                                                                                                                                                                                                                                                                                     543
                                                                                                                                                                                                                                                                                                                                                                                                                                                      715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     305
         밁
                       Qγ
                                        В
                                                     Ωy
                                                                       Вb
                                                                                      QΥ
                                                                                                       Вb
                                                                                                                    Ωy
                                                                                                                                       B
                                                                                                                                                     Qy
                                                                                                                                                                       B
                                                                                                                                                                                    Qy
                                                                                                                                                                                                       Dþ
                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                       DЪ
                                                                                                                                                                                                                                                      QУ
                                                                                                                                                                                                                                                                        DЪ
                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                       Вр
                                                                                                                                                                                                                                                                                                                                                    Qy
         826
```

```
JOURNAL
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source
                                                                                                  706
                                                                                                                         524
                                                                                                                                                                         466
                                                                                                                                                                                                                           406
                                                                                                                                                                                                                                                   527
                                                                                                                                                                                                                                                                                                   467
                                                                                                                                                                                                                                                                                                                                                    407
                                                                                                                                                                                                                                                                                                                                                                                                      347
                                                                                                                                                                                                   587
                                                                                                                                                                                                                                                                            346
                                                                                                                                                                                                                                                                                                                            287
                                                                                                                                                                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                                                                              171
                                                                                                                                                                                                                                                                                                                                                                                                                                                        287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              51
                acctogaacagcocgctgogaccgccggccggccggccaccgttgaagcctggcccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   accgccggccgccgtcgccgatcagcttggcggccccgccgctgccaccggacccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cccgccggtgccgccggtgccgctaccggccgcgcccggacgctgtcgccggt 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       464;
caccggtgccccgttgacgctcaacccgccggtgccgccggcaccgccggcggccaa.
                                                                                                 agttggttagcggtgccagttccgccggtgccggccggtcccgccgttgccggtgaagatg
                                                                                                                                                                                                                                                   gcgccgaagaggatgccggcgttgccgcccgcccggcccggccccgccctcaccgcccacg
                                                                                                                                                                                                                                                                                                   cggtgccgccggggtcgggcgccgagaccggtt-ccggcggttgccgccaatgccgcca
                                                                                                                                                                                                                                                                                                                                                    gccgggaccgaacagtgcgccggcaccgc---cgatgccgccgacgcctcctttgccgc
                                                                                                                                                                                                                                                                                                                                                                                                      gatgccgccggccatttggtccgcactggaggcgcgaaccctccggtgcccccggcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Email: rwing@clemson.edu
High quality sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Clemson University
100 Jordan Hall, Clemson,
Tel: 864 656 7288
Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unpublished (2000)
Contact: Wing RA
Clemson University Genomics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="Vector: pBK-CMV; 626 c 363 g 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xreff"taxon:29729"
/clone="GA_Ea0010021"
/clone_ibp-"Gossypium arboreum 7-10 dpa fiber library" .
/tissue_type="Fibers isolated from bolls harvested 7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Gossypium
/strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      'lab_host="E. coli"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    . .1099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                13.4%;
53.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 155.8; DB 94; Pred. No. 8.2e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        arboreum'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Site_1: EcoRI; Site_2: 57 t 3 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
885
                                                                                                 765
                                                                                                                                                                                                                           465
                                                                                                                                                                                                                                                                           405
                                                                                                                                                                                                                                                                                                                                                                                                      406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      286
                                                 825
                                                                        642
                                                                                                                        583
                                                                                                                                                 705
                                                                                                                                                                                                  645
                                                                                                                                                                                                                                                   586
                                                                                                                                                                                                                                                                                                   526
                                                                                                                                                                                                                                                                                                                                                    466
                                                                                                                                                                         523
                                                                                                                                                                                                                                                                                                                            345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6;
```

```
밁
                                              δÃ
                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                 REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT
AW731157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
          Ş
                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                           BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                     COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ACCESSION
                                                                                                           Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CUS
FINITION
                                                                                                                                                                                                                                                                                                                                                                               JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1066
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1006
                                                                                                                                                                                                                                                                               source
                                                                      175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           946
                                                  195
                                                                                                            Local Sir
nes 453;
                                                                                                                               Match
accgccgatgccgccgacgcctcctttgccgccggttgccgccggggtcgggcgccgag
                              cccacccgcccgccgttgccgaatagccccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cagecegeeggeeggeeggeeggeegttgeeegggeegtcaeceeegge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     actggaggcgccgaaccctccggtgcccccggccgccgggaccgaacagtgcgccggc
                                                                      CACCTTCGCCTCCCGACCTCAACCACCCCCAGCGCTCAAACTGCCCTCCCGACAAGGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCGGCCCCGGCGCGCTCTCGCCCGCGCGCGCGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Unpublished (2000)
Contact: Wing RA
Clemson University Genomics In
Clemson University
100 Jordan Hall, Clemson, SC i
Tel: 864 656 7288
Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AW731157
AW731157.1 GI:76288
EST.
Gossypium arboreum.
                                                                                                                                                                                                                                                                                                                                                                                                                     Malvales;
1 (bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AW731157 1097 bp
GA_Ea0010E01 Gossypium
arboreum cDNA clone GA_
                                                                                                                                                                                                                                                                                                                                                                                       An
of
                                                                                                                                                                                                                                                                                                                                                                                                 Leslie, A., Frisch, D., Yu, Y., Wood, T.C., An integrated analysis of the genetics,
                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                Gossypium arboreum 
Eukaryota; Viridip
                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                   (bases 1
                                                                                                                                                                                                                                                                                                                                                                                        Integrated analysis of the cotton fiber
                                                                                                                                                                                                                                                                                       quality sequence stop: 1097
Location/Qualifiers
                                                                                                                                                                     73
                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                          rwing@clemson.edu
                                                                                                                                                                   /lab_host="E. coli"
/note="Vector: pBK-CMV;
, 642 c 299 g . 7
                                                                                                                                                                                                         /db_xref="taxon:29729"
/clone="GA_Ea0010E01"
/clone_11b="Gossypium arboreum
/tissue_type="Fibers isolated 1
                                                                                                                                                                                                                                                          /organism="Gossypium
/strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                                                   Malvaceae; Gossypium.
1 to 1097)
                                                                                                                                                                                                                                                /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GI:7628815
                                                                                                                                                                                                                                                                               .1097
                                                                                                                    13.1%;
                                                                                                           Score 152.2; DB 94.
Pred. No. 3.2e-16;
0; Mismatches 446;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mRNA
m arboreum 7-10 d
___Ea0010E01, mRN7
                                                                                                                                                                                                                                                                                                                                       SC
                                                                                                                                                                                                                                                                                                                                                            Institute
                                                                                                                                                                                                                                                                                                                                       29634, USA
                                                                                                                                                                                                                                                                    arboreum"
                                                                                                                                                                     ; Site_1: 74 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1098
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mRNA sequence
                                                                                                                              DB 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   dpa f
                                                                                                                                                                                                           n 7-10
from k
                                                                                                                                                                                                                                                                                                                                                                                                  development,
                                                                                                                                                                                                                                                                                                                                                                                                          Wing, R.A. and Wilkins, T.A.
                                                                                                                                                                     EcoRI;
9 othe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fiber library
                                                                                                            Indels
                                                                                                                                                                      others
                                                                                                                                                                                                           ) dpa fiber library"
bolls harvested 7-10
                                                                                                                              Length
                                                                                                                                                                               Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              20-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                   and
                                                                                                            5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gossypium
                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                  evolution
                                                                      234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1065
                                                                                                            Ψ
                             REFERENCE
AUTHORS
                                                                                       KEYWORDS
SOURCE
                                                                                                            ACCESSION
VERSION
                                                                                                                                                           RESULT
AW731204
                                                                                                                                                                                                                                                                                                                                     Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                   맑
                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                         DEFINITION
                                                                                                                                                   Locus
                    TITLE
  JOURNAL
                                                                               ORGANISM
                                                                                                                                                                                                                                        1011
                                                                                                                                                                                                   1071 cccc
                                                                                                                                                                                                                     1034
                                                                                                                                                                                                                                                           974
                                                                                                                                                                                                                                                                              951
                                                                                                                                                                                                                                                                                                                                                                                                                                                          675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       412
                                                                                                                                                                                                                                                                                                                    891
                                                                                                                                                                                                                                                                                                                                      854
                                                                                                                                                                                                                                                                                                                                                          831
                                                                                                                                                                                                                                                                                                                                                                                                  771
                                                                                                                                                                                                                                                                                                                                                                                                                     735
                                                                                                                                                                                                                                                                                                                                                                                                                                        711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   292
                                                                                                                                                                                                                                                                                                                                                                              794
                                                                                                                                                                      σ
                                                                                                                                                                                                                     tgcc
Unpublished
                                                                                         Gossypium
                                                                                                             AW731204.1
                                                                                                                                                                                                   1074
                                                                                                                                                                                                                     1037
                                                                                        arboreum.
(2000)
```

```
cccggc-cgcccgccgtcgccgccgagcccgcctgtgccggtgttcccgactccgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gccggcgccaccgttgaagcctggccgccggccggccgatgccaccggctccgaacag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccgccggtcccgcttgccggtgaagatgccgccgtcgccctccggtgccgcgttccc
                                                                                                                                                                                                                                                                                                                                                                                              CGCGCCCCCGCCGGCGCGCCCCCCCCCCCCCCGCGCGNGCTGGCGCCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                            cgtacagcagcccgccggcccggcttgcccggtccccggtgcgccgttggcgccgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCCCCCCGCGCGCTCCCGCCCCTGCGGCGCGCGCCCCGCCCCGCGTCCCCGGCCCCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggtgccgccggcaccgccggccggccaacacctcgaacagcccgctgcgaccgccggcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cccgccgccccgctgccgccggtgccaccggttgcccccgttgacgctcaacccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tccggccgagccggagactccgaacccgccggcggcgccggcaccgccattggagaacag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgcccgccggcccgccctcaccgcccacgagttggttagcggtgccagttccgccggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    accggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgttgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AW731204 1347 bp mRNA EST

GA_Ea0010K23 Gossypium arboreum 7-10 dpa fiber l

arboreum cDNA clone GA_Ea0010K23, mRNA sequence.

AW731204
An integrated analysis of the cotton fiber
                                                                               Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
       Malvares, ....
1 (bases 1 to 1347)
Leslie,A., Frisch,D., Yu,Y., Wood,T.C.,
Leslie,A. analysis of the genetics,
                                                                    Malvales; Malvaceae;
                                                                                                                                                                           GI:7628863
                                                                   Gossypium
                   Wing, R.A. and development, a
                                                                                                                                                                                                                             fiber library
                                                                                                                                                                                                                                              20-APR-2000
                                                                                        Spermatophyta;
e; eurosids II;
                      and evolution
                                      Wilkins, T
                                                                                                                                                                                                                             Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  973
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  531
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    411
```

```
밁
                                                                                                                     ρ
                                                                                                                                                           Qy
                                                                                                                                                                                    밁
                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                             Qy
 Ş
                     В
                                       δõ
                                                             뫄
                                                                               δÃ
                                                                                                    Вb
                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                         625
                                                              843
                                                                                                     783
                                                                                                                                             723
                                                                                                                                                               445
                                                                                                                                                                                     663
                                                                                                                                                                                                                           603
                                                                                                                                                                                                                                              328
                                                                                                                                                                                                                                                                   543
                                                                                                                                                                                                                                                                                                           483
                                                                                                                                                                                                                                                                                                                                                    423
   685
                       903
                                                                                   565
                                                                                                                         505
                                                                                                                                                                                                       388
                                                                                                                                                                                                                                                                                      268
                                                                                                                                                                                                                                                                                                                              210
                                                                                                                                                                                                                                                                                                                                                                        150
                                                                                                                                                                                                                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                                                                                                                     303
                                                                                                                                                                                                                                                                                                                                                                                                               90
                                                                                                                                                                                                                                      ccggagactccgaacccgccggcgccgccggcaccgccattggagaacagcccgccgccc
                                                                                                                                                        ccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccctccggccgag
                                                                                                                                                                                             ccgccctcaccgccacgagttggtta---gcggtgccagttccgccggtgccggttc
                                                                                                                                                                                                                                                                                                                       gccgctgccaccggacccgccgatgccgccggccatttggtccgcactggaggcgccgaa
                                                                                                                                                                                                                                                                                                                                                                                                       ccgttgaagcctggcccgccggccgccgatgccaccggctccgaacagcccggccgcc
                                  ccgccggtgccgccggttgccaccgttgacgctcaacccgccggtgccgccg
                                                                                                                                            CGGCCGCCGCGCGCGCGCGCGCCCCGCGCGCGCGCCCNGCCCGCCCCGCGCGCGCGCGC
                                                                                                                                                                                   GTGCAGCGCCGCGCGGCGGCGGCCAGCCGAGCCAGCCGGCCCGCCAGCGCGGGGCC
                                                                                                                                                                                                                           GCCCCTCGCCGGCCGAGCGCCCGCCGCCGCCGCCGCGATGCGGGCGCCGCCCCCCC
                                                                                                                                                                                                                                                                                                                                                                                           CCGCGCTCTAGCGCCGCCCCGCGCGCGCGCGCGCGCACCACTGCCGGNCGCCTCA
                                                                                                                                                                                                                                                                                                                                                                                                                                    GCGGCGCGNGCAGCGTGCGCGATGCGGGTGCNGGCTGCGCCGCCGCCACCGCGNCGCACT
                      520;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Tel:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Contact: Wing RA
Clemson University Genomics Institute
Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              High quality sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Email: rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 100 Jordan Hall,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              864 656 7288
864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /db_xref="taxon:29729"
/clone="GA_Ea0010K23"
/clone_lib="Gossypium arboreum 7-10
/tissue_type="Fibers isolated from b dpa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /lab_host="E. coli"
/note="Vector: pBK-CMV; Site_1:
666 c 519 g 63 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Gossypium arboreum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 152; DB 94;
Pred. No. 3.4e-16;
0; Mismatches 507;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29634,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EcoRI; Sit 26 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 1347;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               bolls harvested
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dpa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               fiber library"
s harvested 7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   XhoI"
                     962
                                                                                                     842
                                                                                                                        564
                                                                                                                                            782
                                                                                                                                                              504
                                                                                                                                                                                   722
                                                                                                                                                                                                      444
                                                                                                                                                                                                                          662
                                                                                                                                                                                                                                              387
                                                                                                                                                                                                                                                                   602
                                                                                                                                                                                                                                                                                     327
                                                                                                                                                                                                                                                                                                          542
                                                                                                                                                                                                                                                                                                                              267
                                                                                                                                                                                                                                                                                                                                                   482
                                                                                                                                                                                                                                                                                                                                                                       209
                                                                                                                                                                                                                                                                                                                                                                                           422
                                                                                                                                                                                                                                                                                                                                                                                                                                    362
                                                                                                                                                                                                                                                                                                                                                                                                                                                        89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6,
```

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
AW731135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                 BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                     FEATURES
                                                                                                                                                                                                                                                                                                                                           COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LOCUS
Query Match
Best Local Similarity
Matches 550; Conserv
                                                                                                                                                                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1043
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1023 CCGCGGGCCCCCGCGGCGCGCGCGCGCGCGCGCGCCCCCGCC
                                                                                                                                                                                                                         source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gcggacgccccagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gcccgccggcccgccggttgccccggtgcgccgttggccgttgcccgatca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ctgggccgccggcctggccggccccggccggccgcgttgccgtacagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgggccgtcaccccggccccacccgccccgc-cgttgccgaatagccccgcggctccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccgccgtcgccgc-cgagcccgcctgtgccggtgttcccgactccgccgggccccccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CACGGCCGCCGCGCCCGGCCCGCGCGCGCGCGCGCGCGAGCGGTAGGCCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGGCGCGGCGCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GA__Ea0010A05 Gossypium
arboreum cDNA clone GA__
AW731135
                                                                                                                                                                                                                                                                                                   Clemson University
100 Jordan Hall, Clemson,
                                                                                                                                                                                                                                                                                                                                                                  An integrated analysis of the of the cotton fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gossypium
                                                                                                                                                                                                                                    Email: rwing@clemson.edu
High quality sequence stop: 1711.
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                            Clemson University Genomics
                                                                                                                                                                                                                                                                                                                                         Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                        Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                             Leslie, A., Frisch, D., Yu, Y., Wood, T.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
Malvales; Malvaceae; Gossypium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gossypium arboreum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AW731135.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AW731135
                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1 to 1711)
                                                                                                                                                                                                                                                                         864 656 7288
864 656 4293
 Conservative
                                                                             98
                                                                                                                 /db_xref="taxon:29729"
/clone="GA_Ea0010A05"
/clone_lib="Gossypium arboreum
/tissue_type="Fibers isolated f
dpa"
                                                                         /lab_host="E. coli"
/note="Vector: pBK-CMV; Site_1:
858 c 573 g 115 t
                                                                                                                                                                                    /cultivar="8400"
                                                                                                                                                                                                /strain="AKA"
                                                                                                                                                                                                          organism="Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                               arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GI:7628792
                                                                                                                                                                                                                            . 1711
             12.8%;
48.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1711 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1057
 0;
            Score 149; DB 9
Pred. No. 1e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              arboreum 7-10 dpa fiber library Gossypium _Ea0010A05, mRNA sequence.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mRNA
 Mismatches
                                                                                                                                                                                                                                                                                                    sc
                                                                                                                                                                                                                                                                                                                              Institute
                                                                                                                                                                                                                                                                                                    29634, USA
                                                                                                                                                                                                             arboreum'
                                                                                                                                                                                                                                                                                                                                                                                genetics,
                        94;
                                                                                                                             n 7-10 dpa f
from bolls
                                                                                                                                                                                                                                                                                                                                                                                Wing, R.A. an development,
                                                                            ECORI; Si
79 others
                        Length 1711;
 Indels
                                                                                       Site_2:
                                                                                                                                fiber library"
s harvested 7-10
                                                                                                                                                                                                                                                                                                                                                                                             and Wilkins, T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20-APR-2000
 18;
                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                    Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                  evolution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1042
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             922
5
```

Gaps

```
1218
                                                                                                                                                                                                                                   1038
                                                                                              887
                                                                                                                                                                                                                                                     648
                                                                                                                                                                                                                                                                          978
                                                                                                                                                                                                                                                                                                                                                    858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     678
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 378
                                                                                                                                                                          767
                                                                                                                                                                                                                                                                                            589
                                                                                                                                                                                                                                                                                                              918
                                                                                                                                                                                                                                                                                                                                 529
                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                              738
                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            438
                                                                                                                                                                                                                                                                                                                                                                                         798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              65
                                                                                                                                                                                                                                                                                                                                                                                                                           c-cggcgttgccgcccgcccgccggcccgccctcaccgcccacgagttggttagcggt 419
                                               cggtccccggtgccgttggcgcgttgccgatcagcggacgccccagcaacagctggg
                                                                                                                 gaacagcccgctgcgaccgccggccgccgcggcgccaccgttgaagcctggcccgccggc
                                                                                                                                                                                                                                                                                   gtgcccccgttgacgctcaacc-cgccggtgccggccggcagccggccggcggccaacacctc
                                                                                                                                                                                                                                                                                                                                                    tcgggcgcgccgagaccggttccggcggtgccgccaatgccgccgccgcgcgaagaggatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGCTGGCTGCCCCNAGCCTGCTGGCTCCGCAGCGNACGCAGTCCGTCCGCCCCCGCGCGCA 437
                                                                          ccgccccgccgttgccgaatagccccgcggctccacctgggccgccggcctggccgggcg
                                                                                                                                                                                                                                                                         ggtgccgccgttccctccggccgagccggagactccgaacccgc-----
                                                                                                                                                                                                                                                                                                                                                                                                         gccagttccgccggtgccggtcccgccgttgccggtgaagatgccgccgtcgcctcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccggcca 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cggtgccgccgctaccggccgccccggacgctgtcgccgccggtaccgccggcgccgc 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgatgccagtcccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgc 64
                                                                                                                                                                                                                                                                                                                                                               -cggcg
                                                                                                                                                                                                                                                                        1037
                                                                                                                                                                                                                                                                                                                                                                                                           479
                                                       1006
                                                                                                                1277
                                                                                                                                   886
                                                                                                                                                      1217
                                                                                             946
                                                                                                                                                                                             1157
                                                                                                                                                                                                                                                                                           647
                                                                                                                                                                                                                                                                                                                                588
                                                                                                                                                                                                                                                                                                                                                    917
                                                                                                                                                                                                                                                                                                                                                                      528
                                                                                                                                                                                                                                                                                                                                                                                         857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            497
                                                                                                                                                                                                                                                    707
                                                                                                                                                                                                                                                                                                              977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    737
```

δÃ

Оу Оу Оу Оу Ор

δã

밁

8

20

DP GA

δÃ

β δ

В

밁

60 A

밁

δÃ

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VERSION
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                         BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT
AW731160
             Š
                                      망
                                                               Qy
                                                                                         DЬ
                                                                                                                   δÃ
                                                                                                                                             망
                                                                                                                                                                    QΥ
                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ORGANISM
                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1067
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                       450
                                                                                           390
                                                                                                                    216
                                                                                                                                               330
                                                                                                                                                                        156
                                                                                                                                                                                                  270
                                                                                                                                                                                                                                                      210
                                                                                                                                                                                                                            98
                                                                                                                                                                                                                                                                                38
                                                                                                                                                                                                                                                                                                         Local Similarity
les 547; Conserv
ggtgcccoggcgccgcgggaccgacagtgcgccggccgacgccgacgccgacgcc
                                                                                                                                                              gccaccggacccgccgatgccgccggccatttggtccgcactggaggcgccgaaccctcc
                                                                                                                                                                                                              tgtcgccgccggtaccgccggcggcgccgcgtcgccgatcagcttggc--ggccccgccgccgct 155
                                                                                                                                                                                                                                                     cgtcaccgatcaacccgccggtgccgccggtgccgcgctaccggccgcgcgcccggacgc
                                                     tcctttgccgccggtgccgcggggtcgggcgcgagaccggttccggcggtgccgcc
                                                                                                                                               TCNCCCCCCGGGGCGCGCGGGGGGGCGCCGCGGGGCGGCCGGGCCGGGCCGCCCGCCG
                                      Contact: Wing RA
Clemson University Genomics
Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Leslie,A., Frisch,D., Yu,Y., Wood,T.C., An integrated analysis of the genetics, of the cotton fiber Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          High
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AW731160 1338 bp mRNA
GA_Ea0010E07 Gossypium arboreum 7
arboreum cDNA clone GA_Ea0010E07,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  100 Jordan Hall, (Tel: 864 656 7288 Fax: 864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gossypium arboreum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Malvales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AW731160.1 GI:7628818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AW731160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (bases 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             quality sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                       46
                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="Gossypium
/strain="AKA"
                                                                                                                                                                                                                                                                                                                                                                                    /note="Vector: pBK-CMV; 597 c 619 g (
                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="taxon:29729"
/clone="6A_Ea0010E07"
/clone_lib="Gossypium arboreum 7-10 dpa fiber library"
/tissue_type="Fibers isolated from bolls harvested 7-10"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                               /lab_host="E. coli"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Malvaceae; Gossypium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     to 1338)
                                                                                                                                                                                                                                                                                                                    12.8%;
49.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Clemson,
                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                       Score 148.2; DB 9
Pred. No. 1.4e-15;
0; Mismatches 545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              29634, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     arboreum"
                                                                                                                                                                                                                                                                                                                                                                                    Site_1: EcoRI; Site_2: 68 t 8 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20-APR-2000
-10 dpa fiber library Gossypium
mRNA sequence.
                                                                                                                                                                                                                                                                                                          545;
                                                                                                                                                                                                                                                                                                                                   94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Wing, R.A. and Wilkins, T. development, and evoluti
                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20-APR-2000
                                                                                                                                                                                                                                                                                                          23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         evolution
                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                  329
                                                                                                                                                                        215
                                                                                                                                                                                                                                                      269
                                                                                           449
                                                                                                                                               389
                                                                                                                                                                                                                                                                                97
                                                                                                                                                                                                                                                                                                                                                                                                                                           7-10
                                                                                                                                                                                                                                                                                                          5
```

```
KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                     RESULT 9
BE455283/c
LOCUS
                                                                                                                                                                                                                                                                       δõ
                      REFERENCE
AUTHORS
                                                                                               ACCESSION
VERSION
                                                                                                                                                                                                          В
                                                                                                                                                                                                                          5,
                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                         Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             믕
                                                                                                                                                                                                          1269
                                                                                                                                                                                                                              1116
                                                                                                                                                                                                                                                    1209
                                                                                                                                                                                                                                                                                             1149
                                                                                                                                                                                                                                                                                                                                       1089
                                                                                                                                                                                                                                                                                                                                                                                 1029
                                                                                                                                                                                                                                                                                                                                                           936
                                                                                                                                                                                                                                                                                                                   996
                                                                                                                                                                                                                                                                                                                                                                                                      876
                                                                                                                                                                                                                                                                                                                                                                                                                           969
                                                                                                                                                                                                                                                                                                                                                                                                                                                 816
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    969
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             510
                                                                                                                                                                                                                     ggcctcagcgctcgcgtacgcgccagcagcgcccgcag
                                                                                                                                                                                                                                                                                                                                      GCGCCGCGCACGGGCCCGCGCGCCCGCCCCTCTCCCCCTCCGCTCCGCGGC
                                                                                                                                                                                                                                                                                                                                                 gccgagcccgctgtgccggtgttcccgactccgccgggccccccggcgcgcggagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ggccaacacctcgaacagcccgctgcgaccggccggcccgccggcggccaccgttgaagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccggtgccaccggtgccccgttgacgctcaacccgccggtgccgccggcagcaccgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ggtgaagatgccgccgtcgcctccggtgccgccgttccctccggccgagccggagactcc
                                                                                                                                                                                                         eccescecececececceccececececececece
                                                                                                                                                                                                                                                 CGNCCGCGCGCGCGCCTCCGGGGCGCGCGCGCGGGCGCGGCCGGCCGGCCGGCCG
                                                                                                                                                                                                                                                                   caacagctgggtggtgttcacaatgttgagcaggccctccaacggcgccgcggcggc
                                                                                                                                                                                                                                                                                           gccggcttgcccggtccccggtgcgccgttggcgccgttgccgatcagcggacgcccag
                                                                                                                                                                                                                                                                                                                                                                              cccggcccacccgccgccgttgccgaatagccccgcggctccacctgggccgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCACCGGGC-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    accgcccacgagttggttagcggtgccagttccgccggtgccgccggtcccgccgttgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Eukaryota; Viridiplantae; I
Magnoliophyta; Liliopsida;
1 (bases 1 to 1509)
                                                                                                                        BE455283 1509 bp mkNA
HVSMEh0096004f Hordeum vulgare 5-45 DAP spike EST library
HORDEUM vulgare cDNA clone HVSMEh0096004f,
1 (bases 1 to 1509)
Wing,R., Close,T.J., Kleinhofs,A., Wise,R., Begum,D., Frisch,D.,
Y., Anderson,H., Dale,J., Henry,D., Kernodle,S., Palmer,M., Rami
,T., Saski,C., Schwartzbeck,J., Simmons,J., Choi,D.W., Main,D. au
                                                                                                          mRNA sequence.
BE455283
                                                                Hordeum vulgare
                                                                                      ESI
                                                                                                BE455283.1
                                                                           barley.
                                                                                                GI:9464807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Embryophyta; Tracheophyta;
; Poales; Poaceae; Hordeum.
                                                                                                                                                                                                                            1150
                                                                                                                                                                                                         1303
                                                   Spermatophyta;
                                                                                                                                                                                                                                                                      1115
                                                                                                                                                                                                                                                                                                                1055
                                                                                                                                                                                                                                                                                                                                     1148
                                                                                                                                                                                                                                                                                                                                                                                                                         1028
                                                                                                                                                                                                                                                                                           1208
                                                                                                                                                                                                                                                                                                                                                          995
                                                                                                                                                                                                                                                                                                                                                                               1088
                                                                                                                                                                                                                                                                                                                                                                                                                                              875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            695
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 792
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      635
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           732
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      672
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      455
```

```
BASE COUNT
ORIGIN
 Qy
                      밁
                                         QΥ
                                                                В
                                                                                   Qy
                                                                                                          В
                                                                                                                            Qy
                                                                                                                                                     ₽
                                                                                                                                                                       ρ
                                                                                                                                                                                               В
                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                      DЪ
                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                              1308
                                                                                                           1008
                                                                                                                                                      1068
                                                                                                                                                                                                 1128
                                                                                                                                                                                                                                         1188
                                                                                                                                                                                                                                                                                   1248
                                                                                                                                                                                                                                                                                                                                                                       1368
                                                                                                                                                                                                                                                                                                                                                                                                               source
   595
                                                                                                                                                                                                                                                                                                                                                  124
                                                                                                                                                                          355
                                                                                                                                                                                                                                                                                                        181
                                                                                                                                                                                                                                                                                                                                                                                           64
                                                                                                                                                                                                                                                                                                                                                                                                                          ccgttgacgctcaacccgccggtgccgccggcaccgccggcggccaacacc-
                      gcaccgccattggagaacagcccgccgcccccccgccggtgccccggtgccc
                                                                            cctccggtgccgccgttccctccggccgagccggagactccgaacccgccgccgccg
                                                                                                          aggatgccggcgttgccgcccgcccggcccgccctcaccgcccacgagttggtta
                                                                                                                                                                                                           aacagtgcgccggcacgccgatgccgacgcctcctttgccgccggtgccg-----
                                                                                                                                                                                                                                                                                              gccatttggtccgcactggaggcgccgaaccctccggttgcccccggcgccgccgggaccg
                                                                                                                                                                                                                                                                                                                                         ccqqtgccqccqctaccqgccgcqccccqqacqctqtcqccqccqqtaccqccqgcqqcq
                                                                gcggtgccagttccgccggtgccggccggtcccgccgttgccggtgaagatgccgccgtcg
                                                                                                                                                                                               TCCAGCCGCCCGCGCCCGGCCCCACCCCGCCAGCCCCGGCCCGCGCCCGCGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Tel: 864 656 7288
Fax: 864 656 4293
Email: rwing@clemson.edu
Seq primer: AATTAACCCTCACTAAAGGG
High quality sequence start: 19
High quality sequence stop: 1073.
                                                                                                                                                                                                                                                                                                                                                                                                                                                          al Similarity
520; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Development of a genetically and physically anchored EST resource for barley genomics Unpublished (2000) Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Clemson University Genomics
Clemson University
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      100 Jordan Hall,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          46
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /clone_lib="Hordeum vulgare 5-45
HVcDNA0009 (5 to 45 DAP)"
/tissue_type="5-45 DAP Spike"
/lab_host="SOLR"
/note="Vector: lambdaZAP; Site_1:
303 c 1025 g 128 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="taxon:4513"
/clone="HVSMEh0096004f"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /cultivar="Morex"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Hordeum vulgare"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Socation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .1509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 148; DB Pred. No. 1.5e 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      29634,
                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 108;
1.5e-15;
hes 506;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Site_1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EcoR1;
7 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            spike
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                          19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EST library
 ---t
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
 646
                      829
                                           594
                                                                                     534
                                                                                                                                474
                                                                                                                                                     1009
                                                                                                                                                                         414
                                                                                                                                                                                                                                       1129
                                                                                                                                                                                                                                                                                  1189
                                                                                                                                                                                                                                                                                                                           1249
                                                                                                                                                                                                                                                                                                                                                                                                                1369
                                                                889
                                                                                                                                                                                               1069
                                                                                                                                                                                                                                                                                                                                                                                          123
                                                                                                          949
                                                                                                                                                                                                                    354
                                                                                                                                                                                                                                                            294
                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                     63
                                                                                                                                                                                                                                                                                                                                                                      1309
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ç,
```

DB 94;

4.

```
REFERENCE
AUTHORS
TITLE
     BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                             RESULT 10
AW731134
LOCUS
                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                        SOURCE
                                                                                                                                                                                                                                                                                                 KEYWORDS
                                                                                                                                                                                                                                                                                                           VERSION
                                                                                                                                                                                                                                                                                                                   ACCESSION
                                                                                                                                                                                                                                                                                                                                    DEFINITION
                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                ORGANISM
                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                           1007
                                                                                                                                                                                                                                                                                                                                                                                          410
                                                                                                                                                                                                                                                                                                                                                                                                                             470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            707
                                                                                                    Tel: 804 556 4293
Fax: 864 656 4293
Email: rwing@clemson.edu
High quality sequence stop: 1315.
Location/Qualifiers
1315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cggtccccggtgcgccgttggcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                      cgccggcccgccggcccgccagccgcgcgttgcccgggccgtcacccccggccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cyaacagcccgctgcgaccgccggcccgccggccaccgttgaagcctggcccgccgg
                                                                                                                                                                                                                                                                                                                                                                                          CGCTCCGCCCGCCGCTCTGCGCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                            An integrated analy:
of the cotton fiber
Unpublished (2000)
Contact: Wing RA
Clemson University
Clemson University
                                                                                                                                                                                                                                                                                                AW731134 1315 bp mRNA EST 20-APR-2000 GA_Ea0010A03 Gossypium arboreum 7-10 dpa fiber library Gossypium arboreum cDNA clone GA_Ea0010A03, mRNA sequence.

AW731134 GI:7628791 EST.
                                                                                                                                                                    Clemson University Genomics
Clemson University
100 Jordan Hall, Clemson, SC
                                                                                                                                                                                                                                                            Gossypium arboreum.
Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                 Leslie, A., Frisch, D., Yu, Y., Wood, T.C.,
                                                                                                                                                                                                                                                    Malvales;
                                                                                                                                                                                                                integrated analysis of the genetics, the cotton fiber
                                                                                                                                                                                                                                          (bases 1
              78
dpa"
/lab_host="E. coli"
/note="Vector: pBK-CMV; Site_1:
a 777 c 348 g 101 t
                                                /db_xref="taxon:29729"
/clone="GA_Ea0010A03"
/clone_ib="Gossypium arboreum
/tissue_type="Fibers isolated i
                                                                                           /organism="Gossypium
/strain="AKA"
                                                                                     /cultivar="8400"
                                                                                                                                                                                                                                          Malvaceae; Gossypium.
1 to 1315)
                                                                                                                                                                                                                                                                                                                                                                                                           1031
                                                                                                                                                                     SC
                                                                                                                                                                                       Institute
                                                                                                                                                                     29634, USP
                                                                                                       arboreum'
                                                  from
                                                 7-10 dpa fiber library"
from bolls harvested 7-1
                                                                                                                                                                                                                         Wing, R.A. and Wilkins, T.A. development, and evolution
             EcoRI; Sit
                     Site_2:
                                                                                                                                                                                                                          evolution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        826
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          650
                                                  7-10
                   Š
                                      Вþ
                                                       δÃ
                                                                          В
                                                                                           δÃ
                                                                                                              밁
                                                                                                                               δÃ
                                                                                                                                                  밁
                                                                                                                                                                  Qy
                                                                                                                                                                                     В
                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 483; Conser
    1283
                                       1223
                                                                           1165
                                                                                                                                                  1045
                                                                                                                                                                   741
                                                                                                                                                                                      985
                                                                                                                                                                                                        681
                                                                                                                                                                                                                         925
                                                                                                                                                                                                                                          621
                                                                                                                                                                                                                                                             867
                                                                                                                                                                                                                                                                              561
                                                                                                                                                                                                                                                                                                807
                                                                                                                                                                                                                                                                                                                                   747
                                                                                                                                                                                                                                                                                                                                                     441
                                                                                                                                                                                                                                                                                                                                                                                                           627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     448
                                                                                                                                                                                                                                                                                                                 501
                                                                                                                                                                                                                                                                                                                                                                       687
                                                                                                                                                                                                                                                                                                                                                                                        381
                                                                                                                                                                                                                                                                                                                                                                                                                            321
                                                                                                                                                                                                                                                                                                                                                                                                                                              568
                                                                                                                                                                                                                                                                                                                                                                                                                                                               261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21
   TCGTCCGCGCGC
```

```
cagcccgccggc
                                                                                  CGCGCCACCCTGGCGCCCGCCGTCCCTNCCAGAGCGCTCCCG--CGCCCCCCCGCCGCCGCCC
                                                                                                    gcccgggccgtcacccccggcccaccgccgccgttgccgaatagccccgcgggctcc
                                                                                                                                                       gccaccgttgaagcctggccggccggccgcgatgccaccggctccgaacagcccggc
                                                                                                                                                                                                                                                                                                            gccccgccgctgtgccgccggttgcccccgttgacgctcaacccgccggtgcc
                                                                                                                                                                                                                                                                                                                                                                                                                        cgagccggagactccgaacccgccggcgccggcaccgccattggagaaccagccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggtcccgccgttgccggtgaagatgccgccgtcgcctccggttgccgccgttccctccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gatgccgccgacgcctcctttgccgccggtgccgccggggtcggggtcgggccgagacccggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCCCCTCGCCCCCGCCCGCCCCCCCCCCCCCCCCCCCCGCGGGCCACGCCCGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggcgccgaaccctccggtgcccccggcgccgccggaaccgaacagtgcgccggcaccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ggccgcgcccggacgctgtcgccggtaccgccggcgccgccgtcgccgatcagctt 140
                                                    CGCGCCCTCCCCCCCCCCCCCCCCCCCCTCCCCTGGCCCGGCCGGGGGCCCACGCCC
                                                                                                                                                                                                                                                       CGGCGCCCCTCCCGGTCCCGCGGGCCCCCCCCCCGGCCGGCCGTCGCCCGACCCCGGCCCCCC
                                                                                                                                                                                                                                                                                                                                                                    CCCGGCCCCCCCCCCCCCCCCCCCCCCCATCGTCGCCGCAACCGCCCCCAGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggcggccccgccgctgccaccggacccgccgatgccgccggccatttggtccgcactgga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ggcgccaccagcgcgtcaccgatcaacccgcggtgccgctgtgccgctacc
                             Conservative
 992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12.78;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 147.8; DB 94
Pred. No. 1.6e-15;
0; Mismatches 483;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                              1282
                                                        980
                                                                                    1222
                                                                                                                                                                                                                                                       1044
                                                                                                                                                                                                                                                                                                            984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            388
                                                                                                                                                                                                                                                                                                                                        680
                                                                                                                                                                                                                                                                                                                                                                    924
                                                                                                                                                                                                                                                                                                                                                                                                                        866
                                                                                                                                                                                                                                                                                                                                                                                                                                                    560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      80
```

```
Ş
                                                                                               망
                                                                                                                           ρ
                                                                                                                                                          В
                                                                                                                                                                                        Qy
                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                        Qy
   δÃ
                                  В
                                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                   ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACCESSION
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 11
AZ183795/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                  BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             source
                                                                                                                                                                                                                         748
    591
                                  568
                                                                531
                                                                                                 628
                                                                                                                              475
                                                                                                                                                             889
                                                                                                                                                                                           415
                                                                                                                                                                                                                                                          355
                                                                                                                                                                                                                                                                                         808
gcccccgttgacgctcaacccgccggtgccgccggcaccgccggcggccaacacctcgaa
                                                           gccggcaccgccattggagaacagcccgccgcccccccgccggtgccgccggtgccaccggt
                                                                                                               gcggtgccagttccgccggtgccggtcgccgccgttgccggtgaagatgccgccgtcg
                                                                                                                                                                                                                                           aggatgccggcgttgccgcccgccccggccccgccctcaccgcccacgagttggtta
                                                                                                                                                                                                                                                                                      ccggggtcggcgcgcgagaccggttccggcggtgccgccaatgccgccagcgccgaag
                                                                                                                                                                                                                                                                                                                                                      369;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AZ183795 827 bp DNA GSS 30-AUG-2000 SP_1002_A1_A06_SP6 Strongylocentrotus purpuratus, purple sea urchin , Sperm genomic BAC library Strongylocentrotus purpuratus genomic clone Plate=1002 Col=11 Row=A, DNA sequence.

AZ183795
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 (bases 1 to 827)
Cameron,R.A., Mahairas,G., Rast,J.P., Martinez,P., Biondi,T.R.,
Swartzell,S., Wallace,J.C., Poustka,A.J., Livingston,B.T., Wray
,G.A., Ettensohn,C.A., Lehrach,H., Britten,R.J, Davidson,E.H. ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Strongylocentrotus purpuratus.
Strongylocentrotus purpuratus
Eukaryota; Metazoa; Echinodermata; Eleutherozoa; Echinozoa;
Echinoidea; Euechinoidea; Echinocea; Echinoida;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Plate: 1002 row: A column: 11
Seq primer: SP6
Class: BAC ends
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Contact: Cameron, RA, Davidson, EH,
Division of Biology 156-29
California Institute of Technology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Email: acameron@caltech.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Tel: (626) 395-8421 Fax: (626) 793-3047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pasadena California 91125, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Proc. Natl. Acad.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A sea urchin genome project: Sequence scan, virtual map, and additional resources
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Strongylocentrotidae; Strongylocentrotus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AZ183795.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HOOG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       quality sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="Organ: sperm; Vector: BACe3.6; BAC Clones in E-Coli
DH10B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Strongylocentrotus purpuratus"
/db_xref="taxon:7668"
/db_oxref="taxon:7668"
/clone="plate=1002 Col=11 Row=A"
/clone_lib="Strongylocentrotus purpuratus,
urchin, sperm genomic BAC library"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GI:8356170
                                                                                                                                                                                                                                                                                                                                                                     12.6%;
51.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  166 c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sci. U. S. A.
                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                  Score 146.6; DB 1
Pred. No. 2.7e-15;
0; Mismatches 350
                                                                                                                                                                                                                                                                                                                                                                                                                                               604 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           827.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97 (17),
                                                                                                                                                                                                                                                                                                                                                                                                                                                13 t
                                                                                                                                                                                                                                                                                                                                                                                  DB 176; Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hood,
                                                                                                                                                                                                                                                                                                                                                      350;
                                                                                                                                                                                                                                                                                                                                                                                                                                                24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9514-9518 (2000)
                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                others
                                                                                                                                                                                                                                                                                                                                                                                   827;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            purple
                                                                                                                                                                                                                                                                                                                                                    <u>ب</u>
                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                        414
                                                                                                                                                                                                                                                                                                                     354
 650
                               509
                                                              590
                                                                                                                           530
                                                                                                                                                          629
                                                                                                                                                                                        474
                                                                                                                                                                                                                         689
                                                                                             569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sea
                                                                                                                                                                                                                                                                                                                                                    2;
```

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                         KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 1
AW727529
ORIGIN
           BASE
                                                                                                                                                FEATURES
                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Бр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                            VERSION
                                                                                                                                                                                                                                                                                                                                                                                                            DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                     ACCESSION
                                                                                                                                                                                                                                                  JOURNAL
           COUNT
                                                                                                                                    source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1011 cccc 1014
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             89
                                                                                                                                                                                                                                                                                                                                                                                                                                            12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cagcccgctgcgaccgccggcccgccggcgccaccgttgaagcctggcccgccggcccc 710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ggcccggccggccagccgcgcgttgccgggccgtcacccccggcccacccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         100 Jordan Hall, (Tel: 864 656 7288 Fax: 864 656 4293
                                                                                                                                                                                                                                                             of
                                                                                                                                                                                                                                                                                                                Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                   AW727529 bp mRNA EST 20-APR-2000 GA_EB0012M14 Gossypium arboreum 7-10 dpa fiber library Gossypium arboreum CDNA clone GA_Ea0012M14, mRNA sequence.

AW727529 AW727529
                                                                                                                                                                                                              Clemson University Genomics
Clemson University
                                                                                                                                                                                                                                        Contact: Wing RA
                                                                                                                                                                                                                                                  Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                   Gossypium arboreum.
                                                                                                                                                                                                                                                                                                                                                               AW727529.1 GI:7625085
EST.
                                                                                                                                                                                                                                                                      Leslie,A., Frisch,D., Yu,Y., Wood,T.C., An integrated analysis of the genetics,
                                                                                                                                                                                                                                                                                                         Malvales; Malvaceae;
                                                                                                                                                                                                                                                             integrated analysis the cotton fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             86
                                                                                                                                                                                                                                                                                            (bases 1 to 1292)
                                                                                                                                           1: rwing@clemson.edu quality sequence stop: Location/Qualifiers
           59
           ρ
        /note="Vector: pBK-CMV; 761 c 370 g
                                                   /db_xref="taxon:29729"
/clone="GA_Ea0012M14"
/clone_lib="Gossypium arboreum
/tissue_type="Fibers isolated f
                               /lab_host="E. coli"
                                                                                                  /cultivar="8400"
                                                                                                            /strain="AKA"
                                                                                                                       /organism="Gossypium
                                                                                                                                     .1292
                                                                                                                                                                                                      Clemson,
                                                                                                                                                                                                                                                                                                      Gossypium.
                                                                                                                                                                                                      SC
                                                                                                                                                         1292
                                                                                                                                                                                                                           Institute
                                                                                                                                                                                                      29634,
                                                                                                                         arboreum'
           ; Site_1:
89 t
                                                                                                                                                                                                      USA
                                                      n 7-10 dpa fiber library"
from bolls harvested 7-10
                                                                                                                                                                                                                                                                      development, and
                                                                                                                                                                                                                                                                                 Wing, R.A. and Wilkins, T.A.
          EcoRI; Site_2:
13 others
                                                                                                                                                                                                                                                                      evolution
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     389
```

```
RESULT 1
AW731210
                                                                      밁
                                                                                  Š
                                                                                                    밁
                                                                                                                δõ
                                                                                                                                  В
                                                                                                                                               ρ
                                                                                                                                                                В
                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                           Ъ
                                                                                                                                                                                                                                         QY
                                                                                                                                                                                                                                                         Дb
                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
 VERSION
         ACCESSION
                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                      1156
                                                                                                                                   1036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        y Match
Local Similarity
ches 422; Conserv
                                                                                                                                                                                               916
                                                                                                                                                                                                             798
                                                                                                                                                                                                                             858
                                                                                                                                                                                                                                                           798
                                                                                                                                                                                                                                                                                         738
                                                                                                                                                                                                                                                                                                         618
                                                                                                                                                                                                                                                                                                                        678
                                                                                                                                                                                                                                                                                                                                       562
                                                                                                                                                                                                                                                                                                                                                     618
                                                                                                                                                                                                                                                                                                                                                                                                  442
                                                                                                                                                                                                                                                                                                                                                                                                                 498
                                                                                                                                                                                                                                                                                                                                                                                                                                382
                                                                                                                                                                                                                                                                                                                                                                                                                                                438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             318
                                                                                                                                                                                                                                                                                                                                                                                                                                                               322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             202
                                               13
                                                                                                                                           gttgcccgggccgtcaccccgggcccacccgccgccgttgccgaatagccccgcggc
                                                                                                                                                                                                       ggcgccaccgttgaagcctggcccggccggcccgccgatgccaccggctccgaacagccc
                                                                                                                                                                                                                                                                                                                      gagccggagactccgaacccgccggcggcgccggccgccattggagaacagcccgccg
                                                                                                                                                                                                                                                                                                                                                                                            gtcccgccgttgccggtgaagatgccgccgtcgccgtccggtcccggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ececcec
                                                                                    gatcage
                                                                                                            cagcagcccgccggccgccggcttgcccggtccccggtgcgccgttggcgccgttgcc
                                                                                                                                  ggccgccccgccgtcgccgagcccgccgtgtgccggtgttcccgactccgccgggccc
                                                                                                                                                                                                                                                           gccgccggcaccgccggcggccaacacctcgaacagcccgctgcgaccgccggcccgcc
                                                                                                                                                                                                                                                                                                                                                                                  CGGCGTCGTCGCGCGCGCGCGCGTCGGCGCCCGGACGTCGCCCCCGATCCGCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       atgccgccgacgcctcctttgccgccggtgccgccggggtcggggcgcgcgagaccggtt 321
                                                                                                    ccccgccggtgccgccggtgccaccggtgccccgttgacgctcaacccgccg----gt
                                                                                                                                                                                                                                                                                                                                                     NCTCTCGCGCCTCCAGCCGCGNCCGCCGCGCGCCCCGCCTGATCGCCCGCCTGCGCNGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCGCGCGACGCGTCGCGCCTCGTCGCGCGCGCGCGCGATCCCGCCGCTCCCACGCGCG
GA_Ea0010M11 Gossypium arboreum 7-10 dpa fiber l
arboreum cDNA clone GA_Ea0010M11, mRNA sequence.
AW731210
AW731210.1 GI:7628869
                               AW731210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                     1044
                               1307 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 146.4; DB 94; Length Pred. No. 2.8e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches 419;
                      fiber library Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                               20-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1292;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                   1037
                                                                                                                                                977
                                                                                                                                                                1035
                                                                                                                                                                               917
                                                                                                                                                                                                                             915
                                                                                                                                                                                                                                                                         737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             377
                                                                                                                                                                                               975
                                                                                                                                                                                                             857
                                                                                                                                                                                                                                          797
                                                                                                                                                                                                                                                          857
                                                                                                                                                                                                                                                                                        797
                                                                                                                                                                                                                                                                                                        677
                                                                                                                                                                                                                                                                                                                       737
                                                                                                                                                                                                                                                                                                                                       617
                                                                                                                                                                                                                                                                                                                                                     677
                                                                                                                                                                                                                                                                                                                                                                   561
                                                                                                                                                                                                                                                                                                                                                                                  617
                                                                                                                                                                                                                                                                                                                                                                                                 501
                                                                                                                                                                                                                                                                                                                                                                                                                557
                                                                                                                                                                                                                                                                                                                                                                                                                                441
                                                                                                                                                                                                                                                                                                                                                                                                                                                497
                                                                                                                                                                                                                                                                                                                                                                                                                                                              381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2
                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REFERENCE
AUTHORS
        Ωy
                                      Š
                                                     망
                                                                    δõ
                                                                                                 δõ
                                                                                                                  Вþ
                                                                                                                               Qy
                                                                                                                                                В
                                                                                                                                                              Qy
                                                                                                                                                                               B
                                                                                                                                                                                           δÃ
                                                                                                                                                                                                            Вþ
                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                         source
                                                                                                                                                                                                                                                                   Local L
        499
                        639
                                                      579
                                                                    380
                                                                                     519
                                                                                                    320
                                                                                                                  459
                                                                                                                                                399
                                                                                                                                                                               339
                                                                                                                                                                                             140
                                                                                                                                                                                                             279
                                                                                                                                 260
                                                                                                                                                                200
                                                                                                                                                                                                                                           219
                                                                                                                                                                                                                           82
                                                                                                                                                                                                                                                          22
gccg--
                                                                                                                                                                                                                                                                                                                                                                                                                        High
                                                                                                                                                                                                                                                                                                                                                                                                                                                Tel:
```

```
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcgccaccagcgccgtcaccgatcaacccgccggtgccgccggtgccgcgctaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccgcgccccggacgctgtcgc--cgccggtaccgccggcgcgccgccgtcgccgatcagct 139
                                                     ccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccclccg
                                                                                                                           cgccggcc-cgccctcaccgcccacgagttggttagcggtgccagttccgccggtgccg
                                                                                                                                                                                                  GCCGCGGGGCCACCGCCGCCGGGCGGCGCGCGGCGGGGACGNGCNGTGGGGTCGGGCC
                                                                                                                                                                                                                    cgatgccgccgacgcctcctttgccgccggtgccgccgggggtcgggcgcgagaccgg
                                                                                                                                                                                                                                                                                                                                                                aggcgccgaaccctccggtgcccccggcgccggcaccgaaccagtgcgccggcaccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGTCGCGCCCCCCCCCCCACGCCCCCCCCCCCCTCGCGCCTGCGCCCCGGGCCGGGCCG
                                                                                                                                                                                                                                                                        tggcggccccgccgctgccaccggacccgccgatgccgccatttggtccgcactgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gossypium arboreum.
Gossypium arboreum
Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Contact: Wing RA
Clemson University Genomics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Unpublished (2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              An integrated analysis of the genetics, of the cotton fiber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Malvales; Malvaceae; Gossypium.

1 (bases 1 to 1307)
Leslie, A., Frisch, D., Yu, Y., Wood, T.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Clemson University
100 Jordan Hall, C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      864 656 7288
864 656 4293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   quality sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
-agccggagactccgaacccgccggcggcgccgccgccattggagaaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  rwing@clemson.edu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="taxon:29729"
/clone="GA_Ea0010M11"
/clone_lib="Gossyptium arboreum 7-10 dpa fiber library"
/clone_lib="Gossyptium arboreum 7-10 dpa fiber library"
/tissue_type="Fibers isolated from bolls harvested 7-10 dpa"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ity sequence stop:
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="vector: pBK-CMV; 630 c 544 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /lab_host="E. coli"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /cultivar="8400"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /strain-"AKA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /organism="Gossypium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Clemson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 146.2; DB Pred. No. 3e-15; 0; Mismatches 49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         sc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               arboreum"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Site_1: EcoRI; Si
63 t 10 others
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              496;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    development, and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Wing, R.A. and Wilkins, T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Site_2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1307;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        XhoI"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    evolution
                                                                                        498
                                                                                                                                                              438
                                                                                                                                                                                                  578
                                                                                                                                                                                                                                     379
                                                                                                                                                                                                                                                                      518
                                                                                                                                                                                                                                                                                                                                          458
                                                                                                                                                                                                                                                                                                                                                                             259
                                                                                                                                                                                                                                                                                                                                                                                                                 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                  199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         278
                                                                                                                             638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
```

```
RESULT 1
AW727557
LOCUS
                                                                                                                                                                                                                                            KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                  2
                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                          COMMENT
                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Db
                                                                                          FEATURES
                                                                                                                                                                                                                                                                                   DEFINITION
                                                                                                                                                                                                                                                           VERSION
                                                                                                                                                                                                                                                                    ACCESSION
                                                                                                                                                                                  AUTHORS
TITLE
                                                                                                                                                                                                                                    ORGANISM
                                                                                                                                                                  JOURNAL
                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                    1116
                                                                                                                                                                                                                                                                                                                                                                                                    1058
                                                                                                                                                                                                                                                                                                                                                                                                                    854
                                                                                                                                                                                                                                                                                                                                                                                                                                   998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    939
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    759
                                                                                                                                                                                                                                                                                                                                                                                                                                                   794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    699
                                                                                                                                                                                                                                                                                                                                                                            cgtacagcagccggcccggccggcttgcccggttccccggtgcgccg
                                                                                                                                                                                                                                                                                                                                                                   cggtgccgccggcaccgccggcggccaacacacctcgaacagccgccgctgcgaccgccggccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GA__Ea0012022 Gossypium arboreum 7-10 dpa fiber library Gossypium arboreum clone GA__Ea0012022, mRNA sequence.
                                                                                                                                          Contact: Wing RA
Clemson University Genomics
Clemson University
                                                                                                                                                                          1 (bases 1 to 1440)
1 (bases 1 to 1440)
Leslie,A., Frisch,D., Yu,Y., Wood,T.C., Wing,R.A. and Wilkins,T. and integrated analysis of the genetics, development, and evolution
                                                                                                                                                                                                                Gossypium arboreum
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
                                                                                                                                                                  Unpublished (2000)
                                                                                                                                                                                                                                          Gossypium arboreum.
                                                                                                                                                                                                                                                           AW727557.1
                                                                                                                                                                                                          Malvales; Malvaceae; Gossypium.
                                                                                                                                 lemson University
                                                                                         quality sequence stop:
Location/Qualifiers
                                                                                                                 864 656 7288
864 656 4293
                                                                                                          rwing@clemson.edu
                       /clone="GA__Ea0012022"
/clone_lib="Gossypium arboreum
/tissue_type="Fibers isolated :
                                                /strain="AKA"
/cultivar="84.00"
/db_xref="taxon:29729"
 /lab_host="E. coli"
/note="Vector: pBK-
                                                                        /organism="Gossypium arboreum
                                                                                                                                                                                                                                                            GI:7625114
                                                                                   .1440
 pbK-CMV;
                                                                                                                                   SS
                                                                                                                                   29634, USA
  Site_1:
                         m 7-10
from b
 ECORI;
                         0 dpa :
                                                                                                                                                                                                                                                                                                                                   1225
                                                                                                                                                                                                                                                                                                                                                   1023
                         fiber library"
harvested 7-10
                                                                                                                                                                                                                  Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                   1057
                                                                                                                                                                                                                                                                                                                                                                                                                   913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   793
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    758
                                                                                                                                                                                         Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BASE COUNT
ORIGIN
Qy
                Вb
                              VΩ
                                                В
                                                              Ş
                                                                                 밁
                                                                                               Qy
                                                                                                                 Ф
                                                                                                                              Qy
                                                                                                                                                 밁
                                                                                                                                                                Q
                                                                                                                                                                                 Ъ
                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                               VΩ
                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                               γQ
                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                    862
                                                                                                                                                                                                                                                                                                   446
                                                                                                                                                                                                                                                                                                                   744
                                                                                                                                                                                                                                                                                                                                   386
                                                                                                                                                                                                                                                                                                                                                   889
                                                                                                                                                                                                                                                                                                                                                                                   628
ccgccggcccgccggcttgcccggttccccggtgcgccgttggcgc 1030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  522;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    α
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12.6%;
51.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   rt
```

```
ggccgccggcctggccgggccccggacccgccgccaccaccgcttgc-cgtacagcagc
                                                                                                                                                                                                               ggccgtcaccccggcccacccgccgccgttgccgaatagccccgcggctccacctg
                                                                                                                                                                                                                                 cgccgtcgccgagccggcctgtgccggtgttcccgactccgccggggccccccggcgc
                                                                                                                                                                                                                                                                                                      cgttgaagcctggccgccggccgccgccgccgccggctccgaacagcccggcccc
                                                                                                                                                                                                                                                                                                                                                                          cggagactccgaacccgccggcggcgcggcactcgccattggagaacagcccgccgcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccctccggccgagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccccgcctcaccgccacgagttggttagcggttgccagttccgccggtgccgccggtcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             aaccctccggtgcccccggcgccggccggaccgaacagtgcgccggcaccgccgat-gcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cccggacgctgtcgccgccggtaccgccggcggccgccgtcgccgatcagcttggcggccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGCGTGCNCGTCCCGCGGAGCGCCGCGCGCGCCCCACGCGCCTGCCCGAGCGCCCGAGCGCCCGCG
                                                                                                                                          cgccggtgccgccggtgccaccggttgacgctcaacccgccggtgccgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCCGCACCCCCGCCGCAGGGGGCGCCCCGCCCCGGCGCAGGGGGACGGCGCGCGCGCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CGCGCGCGTGCACGCCGCGCGCCGCCCGGCCGCGCGCCGCCGCCGCCCGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgccgctgccaccggacccgccgatgc-cgccggccatttggtccgcactggaggcgccc
                                                                                                                                                                                                                                                                                                                                                                                                                             Score 146; DB 94;
Pred. No. 3.2e-15;
0; Mismatches 467;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 1440;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17;
```

325 627

687

567 207

266

148 447

8

1274 925 1214 1094 745 1036 981

B

```
Š
                                    밁
                                                             δÃ
                                                                                                  밁
                                                                                                                             Qy
                                                                                                                                                              В
                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCESSION
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 15
CNS0153F
                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BASE COUNT
ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local S
Matches 282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
819 cagcagcccgccggcccggcccggccagccggcgttgcccgggccgtcaccccc
                                    279
                                                                                                                                  699
                                                                                                                                                                  219
                                                                                                                                                                                                 639
                                                                                                                                                                                                                                 159
                                                                                                                                                                                                                                                                 579
                                                                                                                                                                                                                                                                                                                          759 gagcecgectgtgecggtgttecegaeteegeegggeceeeegggegeegeeggaa 818
                                                                                                                                                                                                                                                                                                                                                                               459 gaagatgeegeegtegeeteeggtgeegetteeeteeggeegageeggagaeteegaa 518
                                                                                                                                                                                                                                                                                                 99
                                                                                                                                                                                                                                                                                                                                                             39 GAAGCCCGNCCSCCCCSSCCGCCCGCCCCGCCNCGCGCCCCGCCCCGCGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                            es 282;
                                                                                               caacacctcgaacagcccgctgcgaccgccggcccgccggcgccaccgttgaagcctgg 698
                                                                                                                                                                                                                                                   Web: www.genoscope.cns.fr)

Determination of this BAC-end sequence was carried out as part of a collaboration with the European Drosophila Genome Project (EDGP) thtp://www.edgp.ebi.ac.uk . This Drosophila melanogaster BAC library (Dros BAC) was made by Alain Billaud at CEPH (Centre d'Etude du Polymorphisme Humain) with funding provided by a MRC project grant. The DNA was prepared from embryos by Alain Bucheton and Genevieve Payan. It has been constructed in the vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted (23-JUL-1999) Genoscope - Centre National de Sequencage BP 191 91006 EVRY cedex - FRANCE (E-mail : seqref@genoscope cns.fr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Metazoa; Arthrópoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          fly), genomic survey sequence. AL104949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CNS0153F 1101 bp DNA GSS 26-JUL-1999 Drosophila melanogaster genome survey sequence T7 end of BAC BACN12I14 of DrosbAC library from Drosophila melanogaster (fruit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Genoscope
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Plasmid Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AL104949.1 GI:5616963
                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pBeloBAC11
                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /clone_lib="DrosBAC"
/clone="BACN12I14"
/note="end : T7"
a 566 c 179 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Drosophila
/plasmid="pBeloBAC11"
/db_xref="taxon:7227"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                      12.6%;
48.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                           32;
                                                                                                                                                                                                                                                                                                                                                                                                                         Score 145.8; DB 190;
Pred. No. 3.6e-15;
Pred. No. 3.6e-15; Ir
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  melanogaster"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180 others
                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                          1101;
                                                                                                                                                                                                                                                                                                                                                                                                                         0;
                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           part of a
     878
                                                                                                  338
                                                                                                                                                                  278
                                                                                                                                                                                                                               218
                                                                                                                                                                                                                                                                                                                                                                                                                         0;
```

```
δÃ
                           DЬ
                                      Qy
                                                     Вр
                                                                  δÃ
                                                                                  밁
망
579
              999
                           519
                                         939
                                                      879
                                                                                  399
CCGCCCGCCGSNCGCCSNCCCCCCCCCCGCNCCGCCGCC
       ggcttgcccggtccccggtgcgccgttggcgccgttgcc 1037
                                  ggccccacccgccgccgttgccgaatagccccgcggctccacctgggccgccggcctg 938
                          617
                           578
                                                                                  458
```

Search completed: January 12, 2001, 18:02:03 Job time: 21259 sec

Title: Perfect score:

Scoring table: Sequence: Run

on:

OM nucleic -

Minimum DB Maximum DB

seq

length: length:

Post-processing:

Database

Sequence Sequence Sequence

 φ

Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence Sequence

ω_ω, ω_ν, μ

 ω ω ω

Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli
Appli

```
ptal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          No. is the number of results predicted by chance to have a greater than or equal to the score of the result being printed, s derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nucleic search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Issued_Patents_NA:*

1: /cgn2_6/ptodata/1/ina/5A_COMB.seq:*

2: /cgn2_6/ptodata/1/ina/5B_COMB.seq:*

3: /cgn2_6/ptodata/1/ina/FCTUS_COMB.seq:*

4: /cgn2_6/ptodata/1/ina/FCTUS_COMB.seq:*

5: /cgn2_6/ptodata/1/ina/backfiles1.seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Minimum Match 0%
Maximum Match 100%
Listing first 45 su
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IDENTITY_NUC Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-461-774-9
1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     280836 seqs, 80580151 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           January 12, 2001, 20:14:22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GenCore version
Copyright (c) 1993 - 2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              aattcgatgccagtcccgcc.....cgcccgcagtaaaggtttga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /cgn2_6/ptodata/1/ina/5B_COMB.seq:*
/cgn2_6/ptodata/1/ina/6_COMB.seq:*
/cgn2_6/ptodata/1/ina/PcTUS_COMB.seq:*
/cgn2_6/ptodata/1/ina/backfiles1.seq:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          : 0
: 2000000000
                                                              774
44377
444377
43280
2721
6192
6449
12001
27001
756
5392
                                                                                                                                                                                                                                                                                                                          8438
44377
44377
                                                                                                                                                                                                                                                                                                                                                                              6530
6530
6530
2064
4257
12001
38506
15239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gapext 1
 PCT-US93-03993-1
US-08-343-428-1
US-08-690-473-1
US-08-458-568A-11
US-08-390-878-19
US-08-390-878-17
US-08-9804-227C-7
US-08-9804-227C-7
US-08-956-307B-12
US-08-956-307B-12
US-08-956-307B-12
US-08-956-307B-12
US-08-956-307B-12
US-08-956-307B-11
US-08-95-307B-11
US-08-95-307B-11
US-08-95-307B-11
US-08-95-307B-11
US-08-95-307B-1
US-08-804-227C-1
5215881-2
US-08-479-537A-1
US-08-479-537A-1
US-08-479-537A-1
US-08-485-283-11
US-08-485-285-50
US-08-485-285-50
US-08-913-11
US-08-913-11
US-08-913-11
US-08-913-11
US-08-913-11
US-08-913-11
US-08-913-11
US-08-913-11
US-08-913-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-146-930-1
US-08-458-240-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Search time 153.29 Seconds (without alignments) 1220.609 Million cell upda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .
Մ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    alignments)
Million cell updates/sec
                                                                                                                                                                                      Patent No.
Sequence
Sequence
Sequence
                                                                                           Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                    Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                         Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Description
                                                        Sequence
Sequence
                                                                                                                                                                                                                                                               Sequence
Sequence
                                        Sequence
                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
 1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, Appli
1, 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 1
US-08-146-930-1/c
                     US-08-146-930-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          00000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1, Application Patent No. 5958764
                                                                                                                               TELEPHONE: (213) 489-160
TELEFAX: (213) 955-0440
TELEX: 67-3510
INFORMATION FOR SEQ ID NO: 1
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Roop, Den
APPLICANT: Rothnagel
APPLICANT: Greenhalg
TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                             PRIOR APPLICATION DATA:

PRIOR APPLICATION DATA: including application

PRIOR APPLICATION DATA: described below:

APPLICATION NUMBER: 07/876,286

FILING DATE: April 30, 1992

APPLICATION NUMBER: NO. 1992

APPLICATION UMBER: 30, 1993

APPLICATION OF APPLICATION (204/132)

PRICE OCTOBER 29, 1993

APPLICATION OF APPLICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            444449984494
44449984
                                      STRANDEDNESS:
TOPOLOGY: lin
MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOFTWARE: WordPerfect (Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM:
MEDIUM TYPE: 3.5" Diskette, 1.44 Mb
                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER: 20 TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
ADDRESSEE: LYON & LYON
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET: 611 West : CITY: Los Angeles STATE: California
                                                                                                                                                                                                                                                               NAME: Warburg, Richard J. REGISTRATION NUMBER: 32,3
                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILING DATE:
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC compatible OPERATING SYSTEM: IBM MS-DOS (Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                                LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97
97
97
96
96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         86
86
86
86
86
86
86
86
86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90017
                                                                                           nucleic acid
                                                                                                                    6530 bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  611 West Sixth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rothnagel, Joseph A.
Greenhalgh, David A.
VENTION: SPECIFIC EXPRESSION VECTORS
VENTION: AND METHODS OF USE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Roop, Dennis R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          linear
                                                                                                                                                                                                         (213) 489-1600
                                        DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28958
28958
49377
1288
833
833
18994
118994
111219
11218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               28958
28958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US/08146930
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US/08/146,930
                                                                                                                                                                                                                                                  32,327
ER: 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-08-456-837-6
US-08-457-342-6
US-08-457-646A-6
US-08-764-233A-4
US-08-764-233A-6
US-08-764-233A-6
US-08-764-233A-1
US-08-464-233A-1
US-08-464-233A-1
US-08-464-834-6
US-08-464-834-6
US-08-464-834-1
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
US-08-493-852D-3
                                                                                                                                                                                                                                                204/152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5.0)
```

Result

is

No.

Score

Match Query

189.4 189.4 189.4 128.4

၀ ၀ O

121.8 121.6 1114.4 1113.2 1113.2 1112.2 1112.2 1109.8 1109.8 1109.8 1109.8

107

00

104.4 104 102.6 101.4 101.4 101.2

a

a

Query Match
Best Local Similarity
Matches 509; Conserv

Conservative

0;

16.3%;

16

Ş 밁 δÃ Вþ Ş 밁

196

136

76

3724

256

QΥ

1036

-ccg

1038

```
3844 CCGCCAGAGGAGCCACCTCCACAGCTACCACCTCCTCCGGAAGAGCCCCCCTCCGTAGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgttgccgccc 375
  CAGCTAGAGCCACCGCCCCCCGGAGTACTTGACGCCCCCACCGGAGCCGCCTCCACCG
                              tacagcagcccgccggcccggcttgcccggttccccggttgcgccgtttggcgccgtttg 1035
                                                                                                                                                                                                                                                                                                                                                                                       ccggccgcccgccgtcgccgagcccgcctgtgccggtgttcccgactccgccgggc 795
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccggcgccaccgttgaagcctggcccgccggcccgccgatgccaccggctccgaacagc 735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TTGCCGCCTCCGGAACCGCCGCCGCAGCCACCGGAGCTGCCGGCCTCCAGAGGAGCCTCCG 3245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGCCGCAGCTGGATCCACCGCCACCTGAGTAGCCGCCACAGCTAGAGCCGCCGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCACCGCTAGAACCGCCTCCGTAGCTCTGGCACTGATACTGTTGGGACGATCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAGTAGCCGCCACCGCAGCTGGAGCCTCCGCCCCGGAGTAGCCGCCGCCGCAGCTGGAG 3545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCAGAGGAGCCGCCGCCGCAGCTGCCACCGCCACCGGAATAGCCGCCGCCGCCGCTG 3665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCACCGCAGCCACCGCTGCTGCCGCCACCACCGCTGGAGTAGCAGCCACCGCCGCCACCG
                                                                                         CCCCCAGAGTAGCCACCGCCGCAGCTAGAGCCACCACCGCCTCCGGAGTAGCCGCCGCCG
                                                                                                                       CAGTAGGAGCCGCCCCCCCTGATCCGCCTCCGCAGCTGGAGCCGCCGCCGCCG----CCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9tgccgccggccggccggccgaccacctcgaacagcccgctgcgaccgccggccccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTTCCACCGCCGCAATAGCCGCCTCCGCAGCTGGAGCCACCGCCGCCACCAGAGTAC 3305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CCGCCACCGGAGGAACCACCTCCGCAGCTCGTGCCGCCGCCACCGGAATAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccgccgatgccgccgacgcctcctttgccgccggtgccgccgggggtcgggcgcgcgaga 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGCTGGGGGGCGCAGGAGGTCTGACTGGTCTGCTGAGAGGAGTAATAGCCCCCCTCCGCCG 3725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agettggeggeeeegeegetgeeaceggaeeegeegatgeeggeeatttggteegea 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctaccggccgcgccccggacgctgtcgccggccggtaccgccggcggcgcgccgccgatc 135
                                                                                                                                                                               CCGCAGCTGGAGCCGCCGCCGCCTCCGGAGTAGCCACCTCCGCAGCTGGAGCCGCCGCCG
                                                                                                                                                                                                                                                                      CCCCCACCAGAGCCGCCACCGCCTCCACAGCTGGAGCCACCCCGGAGTAGCTGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccgccgccccgccggtgccgctgctacccggtgcccccgttgacgctcaacccgccg 615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccggccgagccggagactccgaacccgccggcgccgccggcaccgccattggagaacagc 555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccct 495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccccgccggcccccccccgcccagttggttagcggtgccagttccgccggtg 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ctggaggcgcgaaccctccggtgcccccggcgccggcgggaccgaacagtgcgccggca 255
                                                                                                                                                                                                                       ccgttgcccgggccgtcacccccggcccacccgccgccgttgccgaatagccccgcg
                                                                                                                                                                                                                                                                                                            CCGGAGGAGCCGCCGCCACCTAGAGCCGCCGCCGCCACCCTCCGGAGTACTTGACG 3128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCGCCGCAACTGGAGCCACCACCAGGAGGAGCCGCCTCCGCAGCTAGAGCCTCCGCCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgccggtgccgccg 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 189.4; DB 2;
Pred. No. 2.6e-20;
0; Mismatches 511;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6530;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                          915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       675
                                                                                                                                   975
                                                                                                                                                                                                                                                                         3068
                                                                                                                                                                                                                                                                                                                                                                                                                                                      3188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1;
밁
                                       Ş
                                                                                      В
                                                                                                                              οy
                                                                                                                                                                             Вb
                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                    ; MOLECULE TYPE: US-08-458-240-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 2
US-08-458-240-1/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                    Query Match 16.3%;
Best Local Similarity 49.8%;
Matches 509; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 1, Application US/08458240 Patent No. 6143727
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEPAX: (213) 955-0440
TELEX: 67-3510
TELEX: 67-3510
TELEX: 67-3510
TELEX: 67-3510
TELEX: 67-3510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION: APPLICANT: Roop,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: WordPerfect (Version 5.1)
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/458,240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: 3.5" Diskette, 1.44 Mb storage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Rothnagel, Joseph A.
APPLICANT: Greenhalgh, David A.
TITLE OF INVENTION: SPECIFIC EXPRESSION VECTORS
TITLE OF INVENTION: AND METHODS OF USE
                                                                                                                                                                             3904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
LENGTH: 6530 bases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILING DATE: October 29, 1993 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILING DATE:
APPLICATION NUMBER:
FILING DATE: April 3
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STATE: C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET:
CITY: 1
                                                                                                                                                                                                                          16
                                                                                                                                                                                                                                                                                                                                                                                                                          STRANDEDNESS: single TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER: IBM PC compatible OPERATING SYSTEM: IBM MS-DO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ZIP:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADDRESSEE:
TGCTGGGGGGCCCAGGAGGTCTGACTGGTCTGCTGAGAGGAGTAATAGCCCCCCTCCGCCG 372
                            ctaccggccgcgccccggacgctgtcgccggcggtaccggcggcggccgccgtcgccgatc 135
                                                                                                                                                                             CCACCGCAGCCACCGCTGCTGCCGCCACCACCGCTGGAGTAGCAGCCACCGCCGCCACCG
                                                                                                                                                                                                       CCGCCAGAGGAGCCACCTCCACAGCTACCACCTCCTCCGGAAGAGCCCCCTCCGTAGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    90017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Los Angeles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Warburg, Richard J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E: LYON & LYON 611 West Sixth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                          DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dennis R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IBM MS-DOS (Version 5.0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            30,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     No. 6143727 yet assigned (204/132)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    07/876,286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US/08/146,930
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Street
                                                                                                                                                                                                                                                                 Score 189.4; DB 3;
Pred. No. 2.6e-20;
0: Mismatches 511;
                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                6530;
                                                                                                                                                                                                                                                                    Gaps
                                                                                         3785
                                                                                                                                                                               3845
                                                                                                                                                                                                                          75
```

Вр

3244

3127

796

밁 δÃ 밁 Qγ В οy Ъ Qy В QΥ

2947

δõ 밁

616

3304

δ В δÃ Вb Qy В Q 밁 δÃ В

556

3424

3484

436

496

3544

376

3604

316

```
RESULT 3
PCT-US93-03993-1/c
; Sequence 1, Application PC/TUS9303993
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                밁
                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
           APPLICANT: ROOP, Dennis R.
APPLICANT: Rothnagel, Joseph A.
APPLICANT: Greenhalgh, David A.
TITLE OF INVENTION: CONSTITUTIVE AND
TITLE OF INVENTION: VECTOR SYSTEMS
NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                              3127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3724
                                                                                                                                                                                                                                                        2947
                                                                                                                                                                                                                                                                                                              3007
                                                                                                                                                                                                                                                                                                                                                                      3067
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3664
                                                                                                                                                                                                                                                                                                                                                                                                                                                          796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     676
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              196
 ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccccgccggcccccccccccccccgagttggttagcggtgccagttccgccggtg
                                                                                                                                                                                                                          ccg 1038
                                                                                                                                                                                                                                                      CAGCTAGAGCCACCGCCCCCCCCGGAGTACTTGACGCCCCACCGGAGCCGCCTCCACCG
                                                                                                                                                                                                                                                                                                                             CCGGAGGAGCCGCCGCCAGCTAGAGCCGCCGCCGCCACCACCTCCGGAGTACTTGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccggccgcccgccgtcgccgccgagcccggcctgtgccggtgttccccgactccgccgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CAGTAGGAGCCGCCCCCCCTGATCCGCCTCCGCAGCTGGAGCCGCCGCCGCCGC---CCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccggcgccaccgttgaagcctggcccgccggcccgccgatgccaccggctccgaacagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTGCCGCCTCCGGAACCGCCGCCGCCACCGGAGCTGCCGCCTCCAGAGGAGCCTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCGCCGCAGCTGGATCCACCGCCACCTGAGTAGCCGCCGCCACAGCTAGAGCCGCCGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGCCACCGGAGGAACCACCTCCGCAGCTCGTGCCGCCGCCACCGGAATAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccct 495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCACCGCTAGAACCGCCTCCGTAGCTCTGGCACTGATACTGTTGGGACGATCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAGTAGCCGCCACCGCAGCTGGAGCCTCCGCCCCCGGAGTAGCCGCCGCCGCAGCTGGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccggttccggcggtgccgccaatgccgccagcgcgaagaggatgccggcggcgttgccgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCGCCGCAACTGGAGCCACCACCAGAGGAGCCGCCCTCCGCAGCTAGAGCCTCCGCCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccgccgatgccgccgacgcctcctttgccgccggtgccgccgggggtcgggcgcgcgaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CCAGAGGAGCCGCCGCCAGCTGCCACCGCCACCGGAATAGCCGCCGCCGCCGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCCCCAGAGTAGCCACCGCCGCAGCTAGAGCCACCACCGCCTCCGGAGTAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                     CCGCAGCTGGAGCCGCCGCCGCCTCCGGAGTAGCCACCTCCGCAGCTGGAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                               ccgttgcccgggccgtcacccccggcccacccgccgccgttgccgaatagccccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                              CCCCCACCAGAGCCGCCACCGCCTCCACAGCTGGAGCCACCCCGGAGTAGCTGCCGCCG
                                                                                                                                                                                                                                                                               tacagcagcccgccggcccggcttgcccggtccccggtgcgccgttggcgccgttg
Fulbright & Jaworski
                                                       INDUCIBLE
                                                       EPIDERMAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3365
                                                                                                                                                                                                                                                                                  1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        435
                                                                                                                                                                                                                                                                                                                                                                                                  915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3605
                                                                                                                                                                                                                                                        2888
                                                                                                                                                                                                                                                                                                              2948
                                                                                                                                                                                                                                                                                                                                         975
                                                                                                                                                                                                                                                                                                                                                                      3008
                                                                                                                                                                                                                                                                                                                                                                                                                              3068
                                                                                                                                                                                                                                                                                                                                                                                                                                                       855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      315
```

```
밁
                        Q
                                                        밁
                                                                                  δÃ
                                                                                                                  Дb
                                                                                                                                           Qy
                                                                                                                                                                         В
                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                            QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PCT-US93-03993-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 509
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEX: 762829

INFORMATION FOR SEQ ID NO: 1

SEQUENCE CHARACTERISTICS:
LENGTH: 6530 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compati
OPERATING SYSTEM: PC-DOS
SOFTWARE: PatentIn Relea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE/DOCKET NUMBER: D-TELECOMMUNICATION INFORMATION: 713/651-5325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTORNEY/AGENT INFORMATION:
NAME: Paul, Thomas D.
REGISTRATION NUMBER: 32,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION DATA:
APPLICATION NUMBER: PC
FILING DATE: 19930428
                                                                                                                                                                           3604
                                                                                                                                                                                                                                     3664
                                                                                                                                                                                                                                                                                             3724
                                                                                                                                                                                                                                                                                                                                                                                                                  3844
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HYPOTHETICAL:
ANTI-SENSE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STREET: 1301 MCK
CITY: Houston
STATE: Texas
COUNTRY: U.S.A.
ZIP: 77010-3095
                           496
                                                                                                                                                                                                                                                                                                                           196
                                                                                                                                                                                                                                                                256
                                                                                                                                                                                                                                                                                                                                                                                                                                               76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: NUCLEIC ACID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEFAX: 713/651-5246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgccggtgccgccg
CCGCCGCAGCTGGATCCACCGCCACCTGAGTAGCCGCCGCCACAGCTAGAGCCGCCGCTG
             gccccgccggccccgccctcaccgcccacgagttggttagcggtgccagttccgccggtg
                                                                                                                                                                                                                                                                                                                                                                       CCGCCAGAGGAGCCACCTCCACAGCTACCACCTCCTCCGGAAGAGCCCCCCTCCGTAGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                 CCACCGCAGCCACCGCTGCTGCCGCCACCACCGCTGGAGTAGCAGCCACCGCCGCCACCG
                                                        CCGCCACCGGAGGAACCACCTCCGCAGCTCGTGCCGCCGCCACCGGAATAGCCGCCGCCG
                                                                      ccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccct 4555
                                                                                                                  CCACCGCTAGAACCGCCTCCGTAGCTCTGGCACTGATACTGTTGGGACGATCCGCCGCCG
                                                                                                                                                                           GAGTAGCCGCCACCGCAGCTGGAGCCTCCGCCCCCGGAGTAGCCGCCGCCGCCAGCTGGAG
                                                                                                                                                                                         ccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgttgccgccc
                                                                                                                                                                                                                                     CCGCCGCAACTGGAGCCACCACCAGAGGAGCCGCCTCCGCAGCTAGAGCCTCCGCCCCCG
                                                                                                                                                                                                                                                   ccgccgatgccgccgacgcctcctttgccgccggtgcccgaggtcggggtcgggcgcgaga
                                                                                                                                                                                                                                                                                             CCAGAGGAGCCGCCGCCGCAGCTGCCACCGCCACCGGAATAGCCGCCGCCGCCGCTG
                                                                                                                                                                                                                                                                                                             TGCTGGGGGGGCGCAGGAGGTCTGACTGGTCTGCTGAGAGGAGTAATAGCCCCCCTCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 al Similarity
509; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1301 McKinney,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16.3%;
ilarity 49.8%;
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ĕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PCT/US93/03993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               32,714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Suite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 189.4; D
Pred. No. 2.6e-
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  D-5405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1.6e-20;
nes 511;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ω
··
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3845
                             555
                                                        3425
                                                                                                                                              435
                                                                                                                                                                                                                                     3605
                                                                                                                                                                                                                                                                                             3665
                                                                                                                                                                                                                                                                                                                           255
                                                                                                                                                                                                                                                                                                                                                      3725
                                                                                                                                                                                                                                                                                                                                                                                                                  3785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      75
                                                                                                                                                                           3545
                                                                                                                                                                                                        375
                                                                                                                                                                                                                                                                315
```

```
RESULT 4
US-08-343-428-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 1, Application US/08343428 Patent No. 5665586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GENERAL INFORMATION:
                                             CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: PCT/J93/00592
FILING DATE: 30-APR-1993
APPLICATION NUMBER: JAPAN 4-12651:
APPLICATION NUMBER: JAPAN 4-12651:
                                                                                                                                                                COMPUTER: IBM Compatible
OPERATING SYSTEM: MS Dos 5.0
SOFTWARE: WordPerfect 5.0
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Teraoka, Hiroshi
TITLE OF INVENTION: NO. 566
NUMBER OF SEQUENCES: 4
                                                                                                                                                                                                                                     COMPUTER READABLE FORM: MEDIUM TYPE: Diskette,
                 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                          CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3127
                                                                                                                                                                                                                                                                                                 STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3244 CAGTAGGAGCCGCCGCCTCCTGATCCGCCTCCGCAGCTGGAGCCGCCGCCGCCG----CCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 616
                                   FILING DATE:
                                                                                                                                    APPLICATION NUMBER: US/0: FILING DATE: 18-NOV-1994
                                                                                                                                                                                                                                                                          ZIP: 10020-1104
                                                                                                                                                                                                                                                                                       COUNTRY:
                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CAGCTAGAGCCACCGCCCCCCGGAGTACTTGACGCCCCCACCGGAGCCGCCTCCACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CCCCCAGAGTAGCCACCGCCGCAGCTAGAGCCACCACCGCCTCCGGAGTAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CCGCAGCTGGAGCCGCCGCCGCCTCCGGAGTAGCCACCTCCGCAGCTGGAGCCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCCCCACCAGAGCCGCCACCGCCTCCACAGCTGGAGCCACCCCCGGAGTAGCTGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGGAGGAGCCGCCGCCGCCAGCTAGAGCCGCCGCCGCCACCTCCGGAGTACTTGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccggccgccccgccgtcgccgagcccgcctgtgccggtgttcccgactccgccgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ccggcgccaccgttgaagcctggcccggccggcccgccgatgccaccggctccgaacagc 735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TTGCCGCCTCCGGAACCGCCGCCGCAGCCACCGGAGCTGCCGCCTCCAGAGGAGCCTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CTTCCACCGCCGCAATAGCCGCCTCCGCAGCTGGAGCCACCGCCGCCACCAGAGTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tacagcagcccgcccgcccggcttgcccggtccccggtgcgccgttggcgccgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gracegoegecegecegeceaecacctcgaacagccegergecegecegecegecege
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccgccgccccgccggtgccgccggtgccaccggtgcccccgttgacgctcaacccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1038
Haley,
                                                                                                                                                                                                                                                                                                          New York
                                                                                                                                                                                                                                                                                                                                          E: James F. Haley, Jr., Fis. 1251 Avenue of the Americas
                                                                                                                                                                                                                                                                                        USA
                                                                                                                                                                                                                                                                                                                                                                                                                                              Shin, Nasaru
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Tsuzuki, Hiroshige
Kitadokoro, Kengo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nakamura,
                                                                                                                                                                                                                  E: Diskette, 3.50 inch, IBM Compatible
                              UMBER: JAPAN 4-126511
19-MAY-1992
                                                                                                                                                      US/08/343,428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Etsuo
                                                                                                                                                                                                                                                                                                                                                                                                               5665586el Protease
                                                                                                                                                                                                                                                                                                                                                        Fish & Neave
                                                                                                                                                                                                                                         720Kb
                                                                                                                                                                                                                                       storage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3245
```

```
Дb
                                                                                                                                                Ş
                                                                                                                                                                                В
                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: (212)596-9090 INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TELECOMMUNICATION INFORMATION: TELEPHONE: (212)596-9000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOLECULE TYPE:
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
LENGTH: 2064
980
                                                           920
                                                                                                                     960
                                                                                                                                                                                 800
                                                                                                                                                                                                              410
                                                                                                                                                                                                                                          740
                                                                                                                                                                                                                                                                                                      089
                                                                                                                                                                                                                                                                                                                                                                620
                                                                                                                                                                                                                                                                                                                                                                                                                            560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     110 taccgccggcgccgcgtcgccgatcagcttggcggccccgccgccgctgccaccggacccgc 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDENTIFICATION IN NAME/KEY: Sig IN LOCATION: 435.
                                                                                                                                                  458
                                                                                                                                                                                                                                                                        350
                                                                                                                                                                                                                                                                                                                                  290
                                                                                                                                                                                                                                                                                                                                                                                            230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    500 CGGCGCCGCCCGGGCCGGAGCCGACGCCCCAGAGGCCCGCCCCACCCCGGCCTCCGA 559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   50 acccgccggtgccgccgctgccgccgcgccgcgccccggacgctgtcgccgcgg 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRANDEDNESS:
TOPOLOGY: li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REGISTRATION NUMBER: 27
REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IDENTIFICATION METHOD:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IDENTIFICATION METHOD:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY: -10 signal LOCATION: 378..383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IDENTIFICATION
                                                                           accegeeggegeeggeeggeeattggagaacageeeggeegeeggeeggtgeege
                         cggtgccaccggtgcccccgttgacgctcaacccgccggtgccgccggcaccgccggcgg
                                                                                                                                                                                                 gg------ttagcggtgccagttccgccggtgccgccggtcccgccgttgccgg
                                                                                                                                                                                                                                           CGAGCTCGACGCGGCCATGGCCGCCCTGGAGGCACGGGCCAAGATCCCCGGCACCTCGTG
                                                                                                                                                                                                                                                                                                                     tgccgccggggtcgggcgcgagaccggttccggcggtgccgccaatgccgccaacgc
                                                                                                                                                                                                                                                                                                                                                                              cgccgggaccgaacagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccgg 289
                                                                                                                                                                                                                                                                                                                                                                                                                                           GCGCTGCTCGGCGGCCTTCAACGTCACCAAGAACGGCGTTCGGTACTTCCTGACCGCCGG
                                                          CGTCCCCGGCGTGTTCCAGCGCGAGGTGGCCGGCGGCGACGCCATCTACGGCGGCGGCTC
                                                                                                                     CGACCTGGCCCGGCTCCGCAAGGTCGCCGCCTCCCTCGACGGCGCCGTCAGCGTCACCCG
                                                                                                                                       tgaagatgccgccgtcgcctccggtgccgcgttccctccggccgagccgaagactccga
                                                                                                                                                                                 GGGGCTGGACCCGCGCACCAACCGGATCGCCGTGGAGGCCGACTCCTCCGTCTCCGCCCG
                                                                                                                                                                                                                                                                     CGCCGGCACCTACGTGGACGCCGGCACCGGCGAACTCGTCGTCACCGTCACCGAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                            CTCCGCCGCCGCCTCCACGCCCTCGACGCCGTCGAGCGACCCTCGGCGACGACAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 475;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              435..1505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -35 signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Genomic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             METHOD:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      METHOD:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11.1%;
46.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                27794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           γď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   уd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 128.4; DB 1; Pred. No. 1.5e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SHGN-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  experiment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       experiment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           experiment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     experiment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 2064;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
```

637

979 577 919 517

1039

457 859

799

739 349 679

US-08-690-473-1

4.

```
ВР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-08-690-473-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 1, Application US/08690473 Patent No. 5876923
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                      TELEFAX: 512/474-7577
INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1340
                                 SEQUENCE CHARACTERISTICS:
LENGTH: 4257 base pairs
                                                                                     TELECOMMUNICATION INFORMATION:
TELEPHONE: 512/418-3000
TELEFAX: 512/474-7577
                                                                                                                                                            ATTORNEY/AGENT INFORMATION:
NAME: Highlander, Steven L.
REGISTRATION NUMBER: 37,642
                                                                                                                                                                                                                                                                  CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
ADDRESSEE: Arnold, White
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Leopardi, Rosario
APPLICANT: Roizman, Bernard
TITLE OF INVENTION: HERPES SI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1460
                                                                                                                                                                                                                                                                                                                                                                          STREET:
CITY: Hc
STATE: T
COUNTRY:
ZIP: 772
                                                                                                                                             REGISTRATION NUMBER: 37,642
REFERENCE/DOCKET NUMBER: AR
                                                                                                                                                                                                                 CLASSIFICATION:
                                                                                                                                                                                                                                  FILING DATE:
TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                   APPLICATION NUMBER: US/08/690,473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCAGCCGG 1467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                acagctgg 1065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCGCACGACCGCCTGCTCCGCCGGCGGCGCGACAGCGGCGCGCCCCACTTCGCCGGTTCCGT 1399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGACGCCGTCGTGGGCCAGGCCATCAAGAAGAGCGGCTCCACGACCAAGGTCACCAGCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 acagcagcccgccggcccgccggccggccggccgtcacccc 877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGCCCTCGGCATCCACTCGGGCAGCTCCGGCTGCACGGGCACCAACGGCTCCGCCATCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggccgggcgcccggacccgccggccggccgttgccgtacagcagcccgccggcccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CACCGTCAGCGCCGTCAACGTCACCGTCAACTACAGCGACGGCCCCGTCTACGGCATGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGCGAGGGCACCAGCTTCCCGACCAACGACTACGGCATCGTCCGCTACACGACCACGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gcccgccggccgatgccaccggctccgaacagcccggccgccccgccgtcgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCACTGCACCAACCTCTCGTCCACCTGGTCGTCCACCTCCGGCGGCACGTCCATCGGCGT 1099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cggcttgcccggtccccggtgcgccgttggcgctgttgccgatcagcggacgccccagca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cggccccacccgcccgccgttgccgaatagccccgcggctccacctgggccgccgcct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CAACGTGGACGGCCGGGTCAACCTGTACAACGGCGGCTACCAGGACATCGCCTCCGCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                              Houston
                                                                                                                                                                                                                                                                                                                                                                                                             Texas
                                                                                                                                                                                                                                                                                                                                                                                                                                                  P.O. Box
                                                                                                                                                                                                                                                                                                                                                                                              USA
                                                                                                                                                                                                                                  26-JUL-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bernard
HERPES SIMPLEX VIRUS ICP4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INHIBITOR OF APOPTOSIS
                                                                                                                                                                                                                                                                                    Release #1.0,
                                                                                                                                             ARCD: 239
                                                                                                                                                                                                                                                                                        Version
                                                                                                                                                                                                                                                                                        #
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AS
                                                                                                                                                                                                                                                                                        . 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1057
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           937
```

8 밁 Qy В Qy В

959

cggccccgccgttgccgtacagccagccgccggccggcccggcttgcccggtcgccggtg

1018 2903

2843

GGCCGCCGCCCTGGAGGCCTACTGCTCCCCGCGCGCGCGTGGCCGAGCTCACGGACCACCC tgccgaatagccccgggctccacctgggccgccggcctggccgggccccggacccgc CGACCCCTGGGCGGCTGGCGGCGCGCAGCCCCGGGGCCCAGCCACACGGCGCGCCCCGC

2784

839

CGCCGCGGCGCAGGCCCGCCCCCCGTGGCCGTGTCGCCGCCGGCCCGAGGGCCCC

2783

718

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
       Qy
                                      В
                                                               δÃ
                                                                                             B
                                                                                                                      Qy
                                                                                                                                                     д
                                                                                                                                                                               Ş
                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                      20
                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                               οy
                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                       Db
                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                              Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    р
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
Matches 537; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1951
                                        2664
                                                                                               2604
                                                                                                                                                                                                              2484
                                                                                                                                                                                                                                                                      2424
                                                                                                                                                                                                                                                                                                                               2364
                                                                                                                                                                                                                                                                                                                                                                                         2304
                                                                                                                                                                                                                                                                                                                                                                                                                                              2244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2011
                                                                                                                                                                                                                                                                                                                                                           422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       63
                                                                                                                                                                                                                                                                                                                                            --agttccgccggtgccgccggtcccgccgttgccg-gtgaagatgccgccgtcgcctc
                                                                                                                                                                                                                                                                                                                                                                                                    cggcgttgccgcccgcccggcccggccctcaccgcccacgagttggttagcggtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gccggtgccgccgctaccggccgcgcgcccggacgctgtcgccgccggtaccgccggcgcc
                                        GCCCCCTCCACGCCCCGGGGGCCCGAGCCCGCCCCAGCCCGGCGCGCCCCGGGC
                                                      caccggctccgaacagcccggccgccccgccgtcgccgagcccgcctgtgccggtgt 778
                                                                                               GAAGAAGAGCGGCGCGGACGCCCCGGGCTCGGACGCCCGCGCCCCCCTCCCCGCGCCCCGC
                                                                                                                                                                                                                           cgccattggagaacagcccgccgccccgccggtgccgccggtgccaccggtgcccccgt 598
                                                                                                                                                                                                                                                                                                                                                                                                                                              CGAGCTGCGGTTCGTGCGCGACGCGCTGGTGCTCATGCGCCTGCGCGGGGGACCTGCGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                              gggcgcgccgagaccggttccggcggtgccgccaatgccgcc-agcgccgaagaggatgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cagtgcgccggccgacgccgccgcccctcctttgccgccggtgccgccgggggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C-----CGGGGCTGGCCGGGGGCCCGCCAGCCCCCGCGGGGCCGAGGGACCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            catttggtccgcactggaggcgccgaaccctccggtgcccccgggcgccgccggaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCCGACGACGACGCGGGGGGCGCCCAGGCCGGGCGGCGTGGCCGTCGAGTGCCTGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TCCGCCGCCCCGCCTCCCCCGCGGGGGGGGGCGACGCCCGACGCCGACGCCGACGCCGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ttcgatgccagtcccgccggcgccaccagcgccgtcaccgatcaacccgccggtgcc
GCGCAAGAGTCCCGGCCCGGCCCGGCCGGCCGGAGGCCGGCGGCCCGGACCCCCGAAGAC
                                                                                                                                                                    tgacgctcaacccgccggtgccgccggccggccggcggccaacacctcgaacagcccgc
                                                                                                                                                                                                            cggtgccgccgttccctccggccgagccggagactccgaacccgccgccggcgccgccgcac
                                                                                                                                                                                                                                                                                                                               CCTGGGCCCCGCGCGCGCGCGCGCGCCCTGCCGAGCTCCGCGGCCGCCGCCGCCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                    GGCCGGCGGCAGCGAGGCCGTGGCCGCCGTGCGCGTGAGCCTGGTCGCCGGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCTGCCGCGGGATCCTGGAGGCGCTGGCCGAGGGCTTCGACGGCGACCTGGCGGCCGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 126; DB 2;
Pred. No. 3.2e-11;
0; Mismatches 600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            600;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 4257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       122
           838
                                        2723
                                                                                               2663
                                                                                                                                                     2603
                                                                                                                                                                                  658
                                                                                                                                                                                                              2543
                                                                                                                                                                                                                                                                      2483
                                                                                                                                                                                                                                                                                                  538
                                                                                                                                                                                                                                                                                                                               2423
                                                                                                                                                                                                                                                                                                                                                        478
                                                                                                                                                                                                                                                                                                                                                                                       2363
                                                                                                                                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                                                                              2303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
```

```
; ANTI-SENSE: NO; GRIGINAL SOURCE:; ORGANISM: Herpes simplex virus; STRAIN: Herpes Simplex Virus Ty US-08-458-568A-11
                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 6
US-08-458-568A-11/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                   Query Match
Best Local S
Matches 537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 11, Application US/08458568A Patent No. 5821339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
APPLICANT: Schaffer, Priscilla
APPLICANT: Yeh, Lily
TITLE OF INVENTION: Composition
TITLE OF INVENTION: Infections
NUMBER OF SEQUENCES: 15
                                                                                                                                                                                                                                                                                                                          TELECOMMUNICATION INFORMATION:
TELEPHONE: (215) 568-3100
TELEFAX: (215) 568-3439
INFORMATION FOR SEQ ID NO: 11:
                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY/AGENT INFORMATION:
NAME: Leary Ph.D., Kathryn R.
REGISTRAFION NUMBER: 36,317
REFERENCE/DOCKET NUMBER: DFCI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Wordperfect 5.1
CURRENT APPLICATION DATA:
                                                                                                                                                                                                             MOLECULE TYPE:
HYPOTHETICAL:
                                                                                                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS:
LENGTH: 12001 base pai
                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 08/065,146
FILING DATE: 05-MAY-1993
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET: One Liberty CITY: Philadelphia STATE: PA COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: FILING DATE: 02-JUN CLASSIFICATION: 435
                                                    Local Similarity
mes 537; Conserv
                                                                                                                                                                                                                                                TOPOLOGY:
                                                                                                                                                                                                                                                             STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE:
CTCGGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cagcgccc 1146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caatgttgagcaggccctccaacggcgcccgcggcggcctcagcgctccgcgtacgcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGACGATAACCCCCACCCCCACGGGGGCCGCCGGGGGGCCGCCTTTTGGCCCCCCTGCGCGC 3083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCTGTTCCCCGTCCCCTGGCGACCGGCCCTCATGTTTGACCCGCGGGCCCTGGCCTCGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19103
                                                                                                                                                                                                                                                                             nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         E: Woodcock, Washburn, Kurtz, Mackiewicz
One Liberty Place, 46th floor
                                                    Conservative
                                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3091
                                                                                                                                                                                                                NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   02-JUNE-1995
                                                                                                                                                                                                                               DNA (genomic)
                                                                                                                                                                                                                                                               double
                                                                 10.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Compositions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US/08/458,568A
                                                   Score 126; DB 1;
Pred. No. 2.8e-11;
0; Mismatches 600;
                                                                                                                                                                                                                                                                                                                                                                                          DFCI-0029
                                                                                                                                                  Туре
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Methods for Treatment of Herpesvirus
                                                                                Length 12001;
                                                 Indels 11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ç٦
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5821339ris
                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1078
                                                   4;
```

밁 Дb 20 멍 20 В Qy B γ 멍 δÃ Qγ Š Qy Db Дb Ъ В γQ B 20 밁 Q 밁 Qy В Qy B QУ ₽ Qy дb Qy рь Qy В 3650 1079 3710 1019 3770 3890 4010 4070 4190 4250 4310 4370 3830 3950 4130 4490 4430 4543 4603 4663 4723 899 839 243 539 479 422 362 183 303 123 63 caatgttgagcaggccctccaacggcgccgcggcggcctcagcgctcgcgtacgcgc 1138 CGACGATAACCCCCACCCCCACGGGGGCCGCCGGGGGCCCTCTTTGGCCCCCTGCGCGC CGCCGCGCGTGCGCCCGGCCCCCCCGCCGCCAGGCCGCGTGCGGCGGCGGCGACGA GCTGTTCCCCGTCCCCTGGCGACCGGCCCTCATGTTTGACCCGCGGGCCCTGGCCTCGAT 3711 cggccccgccgttgccgtacagcagcccgccggccccgccggcttgcccggtccccggtg GECCGCCGCCTGGAGGCCTACTGCTCCCCGCGCGCGCGTGGCCGAGCTCACGGACCACCC tgccgaatagccccgcggctccacctgggccggcctggccgggcgcccgggacccgc 958 CGACCCCCTGGGCGGCTGGCGGCGGCAGCCCCGGGGGCCCACACGCGGCGCGCCCCGC 3831 CGCCGCGCGCAGGCCCCGCGCCCCCGTGGCCGTGTCGCCGCCGGCCCGAGGGCCCC GCCCCCTCCACGCCCCGGGGCCCGAGCCCGAGCCCCAGCCCGGGGCGCCCCGGGC caccggctccgaacagcccggccgcccgccgtcgccgccgagcccgcctgtgccggtgt GCGCAAGAGTCCCGGCCCGGCCCGGCCGGCGGCGGCGGCCCGCGACCCCCGAAGAC tgacgctcaacccgccggtgccgccggcaccgccggcggccaacacctcgaacagcccgc cgccattggagaacagcccgccgcccgcggtgccggtgccaccggtgcccccgt GGACCTGCTGTTTGACAACCAGAGCCTGCGCCCCCCTGCTGGCGGCGGCGGCCAGCGCACC cggtgccgccgttccctccggccgagccggagactccgaacccgccggcggcgccgccac CCTGGGCCCCGCGCGCGGGACCCGCGCCTGCCGAGCTCCGCGGCCGCCGCCGCCGC ---agttccgccggtgccgccggttcccgccgttgccg-gtgaagatgccgccgtcgcctc GGCCGGCGGCAGCCAGCCGCGTGGCCGCCGTGCGCGCGTGAGCCTGGTCGCCGGGGC cggcgttgccgcccgcccggccccgccctcaccgcccacgagttggttagcggtgc CGAGCTGCGGTTCGTGCGCGACGCGCTGGTGCTCATGCGCCTGCGCGGGGACCTGCGCGT gggcgcgcgagaccggttccggcggtgccgccaatgccgcc-agcgccgaagaggatgc GGGCCCGCTTCCCCGCCGCCGCCGCCGCCGCCGCCCCGCCTGCGCGCGTGGCTGCG cagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccggggtc C-----CGGGGCTGGCCGGGGCCCGGCCCAGCCCCCGCGGGCCGGAGGGACCCCGC catttggtccgcactggaggcgccgaaccctccggtgccccccggcggccgccggaa gccgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccggc TCCGCCGCGCCCCCCCCCGCGGGGGGGGGGCGACGCCGACGCCGACGCCGACGCCGAC 3651 1078 1018 3771 3891 4071 4311 898 838 3951 778 4011 718 658 4191 538 4251 478 421 4371 4431 302 4491 242 4544 182 4604 4664 361

B 8

CTCGGGCC

3583

1139

cagcgccc 1146

```
Qy
                                                                                    망
                                                                                                                          οy
                                                                                                                                                                       В
                                                                                                                                                                                                               Qγ
                                                                                                                                                                                                                                                         рь
                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                   뮹
    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-320-878-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EARLIER APPLICATION NUMBER: CIP OF 09/141,908
EARLIER FILING DATE: 1998-08-28
EARLIER APPLICATION NUMBER: CIP OF 09/073,538
EARLIER FILING DATE: 1998-05-06
EARLIER APPLICATION NUMBER: CIP OF 08/846,247
EARLIER FILING DATE: 1997-04-30
EARLIER FILING DATE: 1997-04-30
EARLIER FILING DATE: 1997-04-30
EARLIER FILING DATE: 1999-02-08
EARLIER APPLICATION NUMBER: 60/110,139
EARLIER FILING DATE: 1998-09-22
EARLIER APPLICATION NUMBER: 60/100,880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-320-878-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQ ID NO 19
LENGTH: 38506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ouery Match 10.5%;
Best Local Similarity 47.5%;
Matches 477; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 19, Application US/09320878A Patent No. 6117659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EARLIER APPLICATION NUMBER: 60//
EARLIER FILING DATE: 1998-05-28
NUMBER OF SEQ ID NOS: 34
SOFTWARE: Patentin Ver. 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: ASHLEY, Gary
APPLICANT: BETLACH, Melanie C.
APPLICANT: BETLACH, Mary C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: U: CURRENT FILING DATE: 1999-05-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: McDANIEL, Robert APPLICANT: TANG, Li
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION: RECOMBINANT NARBONOLIDE POLYKETIDE SYNTHASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILE REFERENCE: 300622002120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: DNA ORGANISM: Streptomyces venezuelae
                                                                                                                                                                                                                                                              28478
                                                                                                                                                                         28538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         72 gccgctaccggcccccggacgctgtcgccggcggtaccgccggcgccgccgtcgcc
gacgtcgccgaccccacgccatgcgcaccctcctcgacgccatccccgccgagacgccc
                        gccgcccgcccggcccggccctcaccgcccacgagttggttagcggttcccgttcc
                                                                                                                                                                     gcccaccacggagccgaacacctcctcctcgtcagccgcagcggagcaagcccccgga
                                                                                                                                                                                             gccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgtt
                                                                                                                                                                                                                                                       ggcaccgtcctcatcaccggcggcaccggagccctcggcagccacgccgcacgctggatg
                                                                                                                                                                                                                                                                                ggcaccgccgatgccgacgcctcctttgccgccggtgc---cgccggggtcgggc
                                                                                                                                                                                                                                                                                                                                          cgccgcctcgccccccccccccggacgtcggcccacccgcgactggcagcccac
                                                                                                                                                                                                                                                                                                                                                                  cgcactggaggcgcgaaccctccggtgcccccggcgcgccgcgggaccgaacagtgcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                     gatcagcttggcggccccgccgctgccaccggatgccgccgtttggtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccggcctcgtcgacctccccgcccagcccgatgccgccgccctcgcccacctcgtcacc
                                                                                  gccacccaactcaccgccgaactcaccgcatcgggcgcccgcgtcaccatcgccgcctgc
                                                                                                                                                                                                                                                                                                                                                                                                                              gcacteteeggegecaeeggegaggaeeagategeeateegeaeeaeeggaeteeaegee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60/087,080
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US/09/320,878A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 121.8;
Pred. No. le-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        507;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 38506;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                          488
                                                                                                                                                                                                                                                                                                    308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           191
                                                                                                                                                                     28597
                                                                                                                                                                                                                                                                                                                                            28477
                                                                                                                                                                                                                                                                                                                                                                                      251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   28357
  28717
                                                                                                                                                                                                                                                         28537
                                                                                    28657
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-390-878-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 17, Patent No. 5
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/390,878
FILING DATE: 17-FEB-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: HINTET, Tom
REGISTRATION NUMBER: 38,498
REFERENCE/DOCKET NUMBER: 15371A-17
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         28898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       28838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29018
                                                                                                                                                                                                                                     COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1011
                                                                                                                                                                                                                                                                                                                                                                                                                     CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Stover, Charles K.
APPLICANT: Mahairas, Gregory G.
TITLE OF INVENTION: VIRULENCE-ATTENUATING
NUMBER OF SEQUENCES: 18
                                                                                                                                                                                                                                                                                                                     STREET: Floor
CITY: San Francisco
STATE: California
                                                                                                                                                                                                                         COMPUTER:
                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccccggtgcgccgttggcgcttgccgatcagcggacgccccag 1055
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gttgccgaatagccccgcggctccacctgggccggcccggcctggccgggcgccccggacc-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gaacagcccggccgccgccgccgccgccgccgctgtgccggtgttcccgactcc 788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cccggcgacgccgtggcgccgaccgggcagtcgtcggcgctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ctgctcgacggcgtcccggaggcccggcaggcgctcgccgcacccgtcggtgccccggct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtggccgatgtcgactgggagcggttcgcgcccgcgttcacggtgtcccgtcccagcctt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cccgaccgcgccctggacgaactggccaaggccctgagccacgacgagaccttcgtcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cggcgccgcgcggggggagacggcgacctcggtcgcctgggggcctctgggccggcgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ggcagcggcagccaggggtctacgcggcggccaacgcccacctcgacgcgctcgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggccccgccggcggccaccgttgaagcctggcccgccggccccgccgatgccaccggctcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ctgctccgcggcactccgctggacgccttcgtcctctactcctcgaacgccggggtctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ccggaggacatcgccgcatcctgggcgcgaagacgagcggcgcgaggtcctcgacgac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gaacagcccgccgccgccggtgccgccggtgccaccggttgacgctcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ctcaccgccgtcgtccacaccgccggcgcaccgggcggcgatccgctggacgtcaccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gttccctccggccgagccggagactccgaacccgccggcggcggcggcggcaccgccattgga 548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cccgccggtgccgccggcaccgccggcggccaacacctcgaacagcccgctgcgaccgcc
                                                                                                                                                                                                                                                                                  94105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7, Application US/08390878 5700683
                                                                                                                                                                                                                                                                                                                                                                              3: Townsend and Townsend Khourie One Market Plaza, Steuart Street
                                                                                                                                                                                                                                                                                                    USA
                                                                                                                                                                                                                      IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENETIC
                                                                                                                                                                                                                                                                                                                                                                              and Cr
                                                                                                                                                                                  #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      896
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              668
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           29017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         28957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28837
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                28777
```

```
US-07-945-283-1/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-390-878-17
                                                                                                                                                                                                 Sequence 1, Application Patent No. 5352596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match 10.5%;
Best Local Similarity 58.6%;
Matches 348; Conservative
                                                                                                                                                                                 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEFAX: 415/543/5043
INFORMATION FOR SEQ ID NO:
                                                                                                                      APPLICANT: Cheung, Andrew APPLICANT: Wesley, Ronald TITLE OF INVENTION: Pseudo TITLE OF INVENTION: Involv
                                                                      NUMBER OF SEQUENCES: 7
CORRESPONDENCE ADDRESS:
ADDRESSEE: Curtis P. Ribando
                                                                                                                                                                                                                                                                                                                                                                                                                  8484 ATTCGGACTCGTTGCC---GTCCCGGGTGCTCCGTCGCCGATTAGCGGACGCCCCAACAA
                                                                                                                                                                                                                                                                                             8601 CGCGATGGTGGCCTCCGCGGCCGCATACGATCCTGACGCCGAGTTCAGCGTCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8364 TCCCCCGGCGCCATTGCCGATCAACGCCGCGGAACCGCCGGCACCGCCGACCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8195 TCCGCCGTTCGCTCCCCAGCCCAAAAGTCCTGTGGCACCGCCGGTTCCGCCGGCTTCCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8075 GACGGTTCTGCCGTCGCCGCCTGGCCCACTGACGCCGTATCCGCCATACAACAGGCCGCC 8134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 15239 base pai
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ZIP:
               COUNTRY:
                              CITY: Peoria
STATE: IL
                                                         STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRANDEDNESS: single TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                             ggcttgcccggtccccggtgccgttggccgttgccgatcagcggacgccccagcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGACGCCGTCGCGGAATAACCGTTGCCGCCGTTGCCGTACAGCAGCCCACCCGCCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcgaccgccggccgccgccgccaccgttgaagcctg--------
                                                                                                                                                                                                                                                                                                                                                     CGTTTCGGTTGGTGCATTGACCGCGCCCCAGCAGCTGTGCTGCTGCGCGGTCTGCAACTGTGA
                                                                                                                                                                                                                                                                                                                                                                                 cagctgggtgggcgtgttcacaatgttgagcag------gccctccaacggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CCAGCCACCG-----TTTGCCGCCGGCTCCCCCGGGGGCGTTGGGGCCGCCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tgt----gccggtgttcccgactccgccggggccccccgggggccgcggagccgaacag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCGGCCTCCGGCCCCCGTGCCACGATCGACACCGACTCCATCACCGAGGCCGCCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACTCATGCCGGGGATGCTCGACGCGCCCCCGGGCCCGATCCCGACCGTTGCCGAGCAG
61604
                            IL
                                                           1815 No. 5352596th University Street
              USA
                                                                                                            Ronald D.

Pseudorables Virus Deletion Mutants
Involving The EPO and LLT Genes
                                                                                                                                                                                                                 US/07945283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   17:
                                                                                                                                                  ۳.
۲.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 121.6; DB 1;
Pred. No. 1.2e-10;
0; Mismatches 199;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 15239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -gcccgccggc 707
| ||||||||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                47;
                                                                                                                                                                                                                                                                                             8654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                1058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8194
                                                                                                                                                                                                                                                                                                                                                                                                                    8540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6
                                                                       δõ
                                                                                                      В
                                                                                                                                   Qγ
                                                                                                                                                                  В
                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                          Qy
                                            В
                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                  ; LOCATION:
US-07-945-283-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                             LOCATION:
FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY:
LOCATION:
FEATURE:
                                                                                                       4484
                                                                                                                                                                  4544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURE:
              307
                                                                                                                                    190
                                                                                                                                                                                                                                                              70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH:
```

δÃ

밁

4545

69

5

4425

366

δã

밁

Ş 밁 Ş

멍

Qγ

В Ş 밁 γ

밁

밁

Qy

```
Query Match
Best Local Similarity 46.7
Matches 536; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEFAX: 309-685-4128 INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOLECULE TYPE:
HYPOTHETICAL: N
ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REGISTRATION NUMBER: 27976
TELECOMMUNICATION INFORMATION:
TELEPHONE: 309-685-4011 ext.513
                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                         ANTI-SENSE: NO ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC
OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                 10 ccagtcccgccggcgccaccagcgccgccgtcacccgatcaacccgccggtgccggcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: UFILING DATE: 19920911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRANDEDNESS: do TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION:
gcgccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcg
                                                                             gcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgcgggggtcgggg 306
                                                                                                                                      tccg---cactggaggcgccgaaccctccggtgcccccggcgccgccgggaccgaacagt 246
                                                                                                                                                                                       CCGAGCGGCAGCAGGCCGCGGACTCTGTCGCCCCTCGTCGCCGCCACCGTGGCCGCCGCTGG 4485
                                                                                                                                                                                                           ccgccgctaccggccgcgccccggacgctgtcgccggcggtaccgccggcggcggcgcgtcg 129
                                                    TCTTCGCCCCGGCCAACGTGGCCGGGGCCCGGCTCGCCGAGGCCGCCGCGCGCCCGGGC
                                                                                                                      TGCGCTACAGCGTGGACGGGGCCCGCGCGCGAGGCCGCCTGGACCTACGCCGCGGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8438 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ribando,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PatentIn Release #1.0, Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           622.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  variation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     variation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    variation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      variation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      variation replace(1099,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pseudorabies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                replace(7010, "g")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   replace(1566,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 replace(1381,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  replace(1267,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Curtis F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .6495
                                                                                                                                                                                                                                                                                                                                                                                                               9.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US/07/945,283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "c")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "c")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "g")
                                                                                                                                                                                                                                                                                                                                                                                               0;
                                                                                                                                                                                                                                                                                                                                                                                           Score 114.4; DB 1;
Pred. No. 1.3e-09;
0; Mismatches 601;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                               Length 8438;
                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                          189
```

```
õ
                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                    RESULT 10
US-08-804-227C-7
                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                   Sequence 7, Application US/08804227C Patent No. 5876991
                                                                                                                                   GENERAL INFORMATION:
APPLICANT: DeHoff
                                                               APPLICANT: Kuhstoss, Stuart A. APPLICANT: Rosteck, Paul R., Jr. APPLICANT: Sutton, Kimberly L. TITLE OF INVENTION: POLYKETIDE S'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4185
            ADDRESSEE: THOMAS G. PLANT 1501
                                                                                                                                                                                                                                                                   3525 CCGGCCTG 3518
                                                                                                                                                                                                                                                                                                   1140 agcgcccg 1147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3765
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4065
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4245
                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4364 CCGCGGAGCCCGCCCCGGC-CTGCCCCCGCTCTGGCCCGAGCAGCCCGGCCTCGTCGTC 4306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        423
                                                                                                                                                                                                                                                                                                                                      CTCTACGACCCGCTGCCCCACGAGGAGCTCTGCGCCGAGCCCCGCGAGGGCCCCCGCGC
                                                                                                                                                                                                                                                                                                                                                         aatgttgagcaggccctccaacggcgccgcggcggcctcagcgctcgcgtacgcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCCGCGCTCGTGTCCTCCTCCTCCTCCTCCTCCTCCGAGGACGACCGGCTCCGGCGC 3886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  accggctccgaacagcccggccgcccgccgtcgccgccgagcccgcctgtgccggtgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GACCGGGGGCCCCGGCGCAAGCGCCGCTCCCTCGGACTCGGGCCCGCCTCCGGACCCCGCT 3946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gaccgccggccgccgccgccgccgttgaagcctggcccg--ccggccccgccgatgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  attggagaacagcccgccgccccccgccggtgccgccggtgccaccggtgcccccgttgac
                                                                                                                                                                                                                                                                                                                                                                                                     CGCCGCCGCCGCCTGGATGCGGCAGATAGCCGACCCCGAGGACGTGCGCGTGGTGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                   TTCGACCCGGCCCCTGGCGCACATCGCCGCGCGCGCGGGGCCCGCGGGCGCCCCCCCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggcccgccgttgccgtacagcagcccgccggcccgccggcttgcccggtcccggtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GTGGCCCGCGCCCTCGTGGACCAGGAGGTCTTCCCCGAACTCTGGCGCCCCGGCGCTCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgaatagccccgcggctccacctgggccggcctggccgggccccggacccggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CTCTCCGGCTCCTCCGGCTACGCCAGCTCCCCCGCCGGCCCGGGACCCAGCGCCCGAG 4126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccgccgttccctccggccgagccggagactccgaacccgccggcgccgccgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGCTCGGGCCCATGCCCGAGCACCCCGCGCCGACGGCGCTTCCGCCGCGTCCCGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gctcaaccogccggtgccgccggcaccgccggcggccaacaccctcgaacagcccgctg-c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGCCCCGCCAGCACCAAGTCCGGCTCCAGCACCAAGTCCAGCTCCGGCACCAAGTCCGGC 4186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     agttccgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggt 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCAGCGCCGGCCGGCGGCGGCGCCCCCCCCGGCTCCCGGCTCCGGGCCCTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ttgccgcccgcccggc----cccgccctcaccgcccacgagttggttagcggtgcc
LILLY CORPORATE CENTER
                                                                                                                                   DeHoff, Bradley S
                                                                POLYKETIDE SYNTHASE GENES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4066
                                                                                                                                                                                                                                                                                                                                      3526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3706
                                                                                                                                                                                                                                                                                                                                                                                                                                     1079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3826
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              779
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4246
```

```
밁
                                                         Qy
                                                                                          ₽
                                                                                                                     2
                                                                                                                                                   В
                                                                                                                                                                               δÃ
                                                                                                                                                                                                              B
                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;
US-08-804-227C-7
                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                           Matches 448;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEPHONE: 317-276-245 INFORMATION FOR SEQ ID NO:
                               22848 GACGCTCCGCCCAGGCGCCGGCCGGGTGGACCTGCCGACCTACGCCTTCCAGCGCGAACG
                                                                                                                                                                                                              22668
                                                                                                                                                                                                                                                                                                                                 22548 CTCCACCGTCGAGGCGGCGCTCCTCGACACCGCCACCCTGGACGCCGACTACTGGTACCG 22607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
NAME: Plant, Thomas, G.
REGISTRATION NUMBER: 35,784
REFERENCE/DOCKET NUMBER: X-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: ASCI(DOS) TE CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                    122
   422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STATE: I
                                                                                                                                                                                                                                                                                                                                                  62 cgccggtgccgcctaccggccgcgccccggacgctgtcgccgccggtaccgccggcgc 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM CON
OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: US/08/804,227C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CITY: INDIANAPOLIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ENGTH:
                                                                                                                                                                      acagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccggggt 301
                                                                                                                                                                                                                                   ccatttggtccgcactggaggcgccgaaccctccggtgcccccgggcgccgccggggaccga 241
                                                                                                                                                                                                                                                                                        cyccytcyccyatcaycttyycyycccyccyctyccaccyyacccyccyatyccyccyg 181
cagttccgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccgg
                                                                                                          cgggcgcgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgc
                                                                                                                                                   CGACGCGTTCGTGGAGTGCTCCGCGCATCCCGTCCTGACCGTCGGCGTGCGCCAGACCGT
                                                                                                                                                                                                                                                                       CAACCTGCGCCTCCCGGTGCGCTTCGAGCCGACCGTACGCGCCATGCTCGACGACGCCGT
                                              cggcgttgccgcccgcccgcccgccccccccccccccaccgagttggttagcggtgc
                                                                                          GCGGCGCTTCCTCACCTCCGCCGCCGAGGCCCAGGTCGTCGGCGTCCCCGTGGACTGGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  46285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                USA
                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
31329.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               linea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IBM Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    36155..41830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
20110..31284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
14046..20036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CDS
350..14002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     317-276-2459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           February 21,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                         9.8%;
46.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .36071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Text only
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       7 :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   X-8231
                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                      Score 113.2; Db z;
Pred. No. 1.7e-09;
""cmatches 513;
                                                                                                                                                                                                                                                                                                                                                                                                                     Length 44377;
                                                                                                                                                                                                                                                                                                                                                                                         7;
                                                                                                                                                                                                                                                                                                                                                                                           Gaps
 481
                                                           421
                                                                                                                       361
                                                                                                                                                   22787
                                                                                                                                                                                                                                                                       22667
                                                                                                                                                                                                              22727
                                                                                          22847
```

2;

```
RESULT 11
US-08-804-198-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 1, Application Patent No. 5945320
GENERAL INFORMATION:
APPLICANT: Burget
                                                                                                                                                                                                                          APPLICANT: Richardsou, APPLICANT: Rosteck, Paul R., Jr.
APPLICANT: Rosteck, Paul R., Jr.
TITLE OF INVENTION: PLATENOLIDE SYNTHASE GENE
NUMBER OF SEQUENCES: 6
CORRESPONDENCE ADDRESS:
ADDRESSEE: PAUL R. CANTRELL 1138
STREET: LILLY CORPORATE CENTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       23328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     23028
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1016
                                                      CURRENT APPLICATION DATA:
APPLICATION NUMBER: US
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                               COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                               COMPUTER: Macintosh
OPERATING SYSTEM: Macintosh 7.0
SOFTWARE: Microsoft Word 5.1
                                      FILING DATE:
                                                                                                                                                                                                                        STREET: LILLY CORP.
CITY: INDIANAPOLIS
STATE: IN
                                                                                                                                                                                   ZIP: 46285
                                                                                                                                                                                                         COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgccaccggctccgaacagcccggccgccccgccgtcgccgagcccgcctgtgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGGTCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gtgcgccg 1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgccggcccgccgttgccgtacagcagcccggccggcccggcttgcccggtccccg 1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cyccyycccyccayccycyttycccyyyccytcaccccyyccccacccyccccyc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGCCTTCGACCCGGCACGCACCGGACGCGACCTGTTCGGCCTGCTCGAGACGGAGAT 23207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CACCGGCGGCTGGCCCCGGCCTGCCTGCTGATCGTGCCCACCGGGGACCAGTACAC 23087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGCTGGAGCTGCCCGAGGTGTGGGGCCGGCCGCATCGACCTTCCCCGCGCGCCGGACGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCCCGACGAACTGCCGTGCACCGCCGG-TGCCCAGCTGTGGGGCCTGGGCCGGGTGGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgttgccgaatagccccgcggctccacctgggccgccggcctggccgggcgcccggacc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGCCGACCTCGGCAGCACCGCACCGCTGTGGACCGTCACCTGCGGCGCGGTCGCCACCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCCGGACCACCCCGCCGTGCCCGTCGCCGTCACCGCCACCCTCGCCCTCGTCCAGGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tgttcccgactccgccgggccccccggcggccgccggagccgaacagcccgcccggccc 835
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CAACGGCGACACCGCCGTCACCGGCGTCGTCTCGCTCCGCACTGTGCACCGACGGCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGCCCTCGCCGACACCCTGGAACAGGCGGTCGCCTCCTTCGGCGGAACGGTCCGCCGCGT 23147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cattggagaacagcccgccccccccgccggtgccgccggtgccaccggtgccc----c 595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CGCCCGGAGCCCGGAGACCGGCTCGGCTACCACGTCGCGTGGAAGGGACTGCGCTCCAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgttgacgctcaacccgccggtgccgccggcagccggcggccaacacctcgaacagcc 655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tgccgccgttccctccggccgagccggagactccgaacccgccggcggcgccgccggcaccgc 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Application US/08804198
                                                                                                                                                                                                                                                                                                                                                                                                          Burgett, Stanley G.
Kuhstoss, Stuart A.
                                                                                                                                                                                                         USA
                                                                                                                                                                                                                                                                                                                                                                                         Rao, Nagaraja R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23514
                                                        US/08/804,198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23027
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   955
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            895
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       23387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22967
```

```
Š
                                                                                           Ş
                                                                                                                           밁
                                                                                                                                                         Ş
                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                            멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; LOCATION:
US-08-804-198-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEPHONE: 317-276-3885
INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                         22908
                                                                                                                                                                                                                                                    22848 GACGCTCCGCCCAGGCGGCCGGCCGGGTGGACCTGCCGACCTTACGCCTTTCCAGCGCGAACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22608 CAACCTGCGCCTCCCGGTGCGCTTCGAGCCGACCGTACGCCCATGCTCGACGACGCCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LOCATION:
FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME: CANTRELL, PAUL R.
REGISTION NUMBER: 36,470
REFERENCE_POCKET NUMBER: P91
TELECOMMUNICATION INFORMATION:
TELEPHONE: 317-276-3885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LENGTH: 44377 base pairs TYPE: nucleic acid STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY:
                     ccatttggtccgcactggaggcgccgaaccctccggtgcccccgggcgccgcgggaccga 241
CGCCCTCGCCGACACCCTGGAACAGGCGGTCGCCTCCTTCGGCGGAACGGTCCGCCGCGT 23147
                                                             CACCGGCGGCTGGCGCCCGGCCTGCGCCTGATCGTGCCCACCGGGGACCAGTACAC
                                                                                         cattggagaacagcccgccgccccccccgccggtgccgcggtgccaccggtgccc----c
                                                                                                                          CGCCCCGGAGCCCGGAGACCGGCTCGGCTACCACGTCGCGTGGAAGGGACTGCGCTCCAC 23027
                                                                                                                                               CCACTGGGTCGGCCCGGCCCGGCCGACTCCGCGGCGACGGCCGACGACCGGTGACGA 22967
                                                                                                                                                                                                          cggcgttgccgccgcccgccggccccgccctcaccgcccacgagttggttagcggtgc
                                                                                                                                                                                                                                                                                                                GCGGCGCTTCCTCACCTCCGCCGCCGAGGCCCAGGTCGTCGGCGTCCCCGTGGACTGGGC
                                                                                                                                                                                                                                                                                                                                       cgggcgcgccgagaccggttccggcggtgccgcaatgccgccagcgcgaagaggatgc
                                                                                                                                                                                                                                                                                                                                                                            acagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgcgggggt
                                                                                                                                                                                                                                                                                                                                                                                                                                            CGACGCGTTCGTGGAGTGCTCCGCGCATCCCGTCCTGACCGTCGGCGTGCGCCAGACCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgccgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccgg 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTCCACCGTCGAGGCGGCGCTCCTCGACACCGCCACCCTGGACGCCGACTACTGGTACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 448;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CANTRELL, PAUL R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    350.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
31329.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CDS
20110.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CDS
36155..41830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14046..20036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .14002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9.8%;
46.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .31284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          36071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           P9113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 113.2; DB 2; Pred. No. 1.7e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 44377;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              7;
```

22607

2

22847

361 22787

```
RESULT 12
US-08-956-307B-12/c
; Sequence 12, Application US/08956307B
; Patent No. 6090911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                             TELEX: 200154
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    23388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Petka, Wendy A.
APPLICANT: Tirrel1, David A.
APPLICANT: Kevin P. McGrath
TITLE OF INVENTION: REVERSIBLE HYDROGELS
NUMBER OF SEQUENCES: 24
                                                                                                                          TELEPHONE: 617/542-5070
                                                                                                                                                                                  APPLICATION NUMBER: FILING DATE: ATTORNEY/AGENT INFORMATION: NAME: Fasse, J. Peter
                                                                                                                                                                                                                                      APPLICATION NUMBER: US/OFILING DATE: 22-OCT-1997 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM: MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
ADDRESSEE: Fish & Richardson
STREET: 225 Franklin Street
                                                                                                                                                                                                                                                                                  CURRENT APPLICATION DATA:
MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             656
                                                                                                                                                                                                                                                                                          COMPUTER: IBM Compatible
OPERATING SYSTEM: Windows 95
SOFTWARE: FastSEQ for Windows
                                                                                                TELEPHONE: 51/7-8906
                                                                                                                                                                     NAME: Fasse, J. Peter REGISTRATION NUMBER:
                        STRANDEDNESS: single
                                                                                                                                                      REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                COUNTRY:
                                                    LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGGTCCTG 23514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gtgcgccg 1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCCCGACCTCGGCACCGCACCGCTGTGGACCGTCACCTGCGGCGCGGTCGCCACCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCCCGACGAACTGCCGTGCACCGCCGG-TGCCCAGCTGTGGGGCCTGGGCCCGGGTGGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCCGGACCACCCGTCGCCGTCGCCGTCACCGCCACCCTCGCCCTCGTCCAGGCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CGCCTTCGACCCGCACCGGACGCGGCGGCGAGCTGTTCGGCCTGCTCGAGACGGAGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tgccaccggctccgaacagcccggccgccccgccgtcgccgagcccgagcccgcctgtgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgctgcgaccgccggccggccggccaccgttgaagcctggcccgccggcccgccga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 02110-2804
                                                                                                                                                                                                                                                                                                                                                                                                            Boston
                                        nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                MA
                                                    774 base pairs
                                                                                                                                                                                                                                                                                                                                                                                 USA
                                                                                                                                                                                                                                                                     US/08/956,307B
                                                                                                                                                                   32,983
                                                                                   12:
                                                                                                                                                       07880/033001
                                                                                                                                                                                                                                                                                                                                                                                                                                       P.C.
                                                                                                                                                                                                                                                                                               Version
                                                                                                                                                                                                                                                                                                 .
6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            835
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  23327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               955
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      895
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23267
```

```
US-08-956-307B-12
```

```
US-08-956-307B-11
                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                     дb
                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                           γQ
                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                           Sequence 11, Application US/08956307B Patent No. 6090911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches 354;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                            GENERAL INFORMATION:
                                          APPLICANT: Petka, Wendy A.
APPLICANT: Tirrell, David A.
APPLICANT: Kevin P. McGrath
TITLE OF INVENTION: REVERSIBLE
NUMBER OF SEQUENCES: 24
CORRESPONDENCE ADDRESS:
ADDRESSEE: Fish & Richardson
STREET: 225 Franklin Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               764
                                                                                                                                                                                                                                                                      777
                                                                                                                                                                                                                                                                                                     104
                                                                                                                                                                                                                                                                                                                                                                 164
                                                                                                                                                                                                                                                                                                                                                                                              657
                                                                                                                                                                                                                                                                                                                                                                                                                             224
                                                                                                                                                                                                                                                                                                                                                                                                                                                           597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            57
                                                                                                                                                                                                                                         44
                                                                                                                                                                                                                                                                   gttcccgactccgccgggccccccggcgccgccgag 813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            accgccattggagaacagcccgccgccgccgccggtgccgccggtgccaccggtgccccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         accgaacagtgcgccggccgaccgccgatgccgccgccgcctttgccgccggtgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggcgccgccgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgcc 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGTGCCGGCGCTGGTGCGGGCCCGGAAGGTGCAGGCGCCGGTGCCGGGAAGGTGCC 705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ggtgccgccggtgccgcctaccggccgcgccccggacgctgtcgccggctaccgcc 116
                                                                                                                                                                                                                                       GGCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAG
                                                                                                                                                                                                                                                                                                   GGTGCGGGCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCCGGCGCTGGTGCG
                                                                                                                                                                                                                                                                                                                     gccaccggctccgaacagcccggccgccccgccgtcgccgagcccgcctgtgccggt
                                                                                                                                                                                                                                                                                                                                                               GGCGCTGGTGCGGGCCCGGAAGGTGCAGGCGCCTGGTGCGGGCCCCGGAAGGTGCCGGCGCT
                                                                                                                                                                                                                                                                                                                                                                                    GGTGCCGGCGCTGGTGCGGGCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                              CCGGAAGGTGCCGGCCTGGTGCGGGCCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCCGGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCGGGCCCGGAAGGTGCCGGCCGGTGCGGGCCCGGAAGGTGCAGGCGCTGGTGCCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tccggtgccgcgttccctccggccgagccgagactccgaacccgccggcgccgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCTGGTGCGGGCCCGGAAGGTGCCGGCGCTGCTGCCGGGCCCCGGAAGGTGCAGGCGCTGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ggtgccagttccgccggtgccggtcccgccgttgccggtgaagatgccgccgtcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCAGGCGCTGGTGCGGGCCCGGAAGGTGCCGGCCCTGGTGCGGGCCCGGAAGGTGCAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gatgccggcgttgccgcccgcccgcccgccccgccctcaccgcccacgagttggttagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAAGGTGCAGGCGCTGGTGCGGGCCCCGGAAGGTGCCGGCCCTGGTGCCGGGCCCGGAAGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ggggtcgggcgcgagaccggttccggcggtgccgccaatgccgccagcgccgaagag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCCCGGAAGGTGCAGGCGCTGGTGCCGGGCCCCGGAAGGTGCCGGCCCTGGTGCCGGGCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGTGCGGGCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCCGGAAGGTGCCGGCGCTGGTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccggccatttggtccgcactggaggcgccgaaccctccggtgcccccgggcgccgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCGCTGGTGCGGGCGGCGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCCGGCGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 112.2;
Pred. No. 3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                HYDROGELS
                   P.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ), DB 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            403;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ω,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 645
                                                                                                                                                                                                                                                                                                                                                                                              716
                                                                                                                                                                                                                                                                                                                                                                                                                             165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            465
                                                                                                                                                                                                                                                                                                   45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    585
                                                                                                                                                                                                                                                                                                                                                                 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                           656
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      296
```

COUNTRY:

Boston : MA RY: USA 02110-2804

```
QY
                                                                 밁
                                                                                             QΥ
                                                                                                                                 B
                                                                                                                                                                Q
                                                                                                                                                                                                    В
                                                                                                                                                                                                                                Qγ
                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                  Qγ
                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                           γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               БР
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 778 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OPERATING SYSTEM: Windows 95
SOFTWARE: FastSEQ for Windows Version 2.0b
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELECOMMUNICATION INFORMATION: TELEPHONE: 617/542-5070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTORNEY/AGENT INFORMATION:
NAME: Fasse, J. Peter
REGISTRATION NUMBER: 32,
REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: US/0 FILING DATE: 22-OCT-1997 PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY: linear MOLECULE TYPE: DNA
491
                   537 accgccattggagaacagcccgccgccccggccggtgccggcggtgccaccggtgccccc
                                                                                                   477
                                                                                                                                    371
                                                                                                                                                                      417
                                                                                                                                                                                                                                     357
                                                                                                                                                                                                                                                                       251
                                                                                                                                                                                                                                                                                                         297
                                                                                                                                                                                                                                                                                                                                                                                                            131
                                                                                                                                                                                                                                                                                                                                                                                                                                           177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX: 01...
TELEFAX: 200154
                                                                                                                                                                                                                                                                                                                                          191 GGCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCCGGCGCTGGTGCGGGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        117 ggcgccgccgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgcc 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11 GGTGCCGGCCGGGGCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCC 70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57 ggtgccgccggtgccgccgctaccggccgcgcgcccggacgctgtcgccggctaccgcc 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TYPE: nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER: IBM COMPUTER: OPERATING SYSTEM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE:
CCGGAAGGTGCCGGCGCTGGTGCGGGCCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAA 550
                                                                                      ggtgccagttccgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcc 476
                                                                                                                                                                                                                           gatgccggcgttgccgcccgcccggccggccctcaccgcccacgagttggttagc
                                                                                                                                                                                                                                                                     GAAGGTGCAGGCGCTGGTGCCGGGCCCCGGAAGGTGCCGGCCCTGGTGCGGGCCCCGGAAGGT
                                                                                                                                                                                                                                                                                       ggggtcgggcgccgagaccggttccggcggtgccgccaatgccgccagcgccgaagag 356
                                                                                                                                                                                                                                                                                                                                                            accyaacaytycyccygcaccyccyatyccycc 296
                                                                                                                                                                                                                                                                                                                                                                                                                                 gccggccatttggtccgcactggaggcgccgaaccctccggtgcccccgggggcgccgcggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                354;
                                                                 GCGGGCCCGGAAGGTGCCGGCGCTGGTGCGGGCCCCGGAAGGTGCAGGCCCTGGTGCGGGC
                                                                                                                                    GCTGGTGCGGGCCCGGAAGGTGCCGGCGCTGGTGCGGGCCCGGAAGGTGCAGGCGCTGGT 430
                                                                                                                                                                                                    GCAGGCGCTGGTGCGGGCCCGGAAGGTGCCGGCGCGCTGGTGCGGGCCCGGAAGGTGCAGGC
                                                                                                                                                                                                                                                                                                                                                                                                            GGTGCGGGCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCCGGCGCTGGTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGCGCTGGTGCGGGCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCCGGCGCT 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /542-8906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US/08/956,307B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       32,983
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0; Mismatches 403;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         07880/033001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 112.2; DB 3 Pred. No. 3.6e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                778;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                     416
                                                               490
                                                                                                 536
                                                                                                                                                                                                                                                                       310
                                                                                                                                                                                                                                                                                                                                                                                                          190
                                                                                                                                                                                                                                                                                                                                                                                                                                           236
                                                                                                                                                                                                    370
                                                                                                                                                                                                                                                                                                                                        250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0
```

```
US-08-804-227C-7/c; Sequence 7, Application; Patent No. 5876991; GENERAL INFORMATION: APPLICANT: DeHOff,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                         INFORMATION FOR SEQ ID NO:
                                                                                                                                                                 NAME/KEY:
LOCATION:
FEATURE:
                            LOCATION: FEATURE:
                                                                                                                                                                                                                                                                                                                                      REFERENCE/DOCKET NUMBER: X-TELECOMMUNICATION INFORMATION: 317-276-2459
                                                                                                                                                                                                                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
NAME: Plant, Thomas, G.
REGISTRATION NUMBER: 35,784
                                                                                                                                                                                                                                                                                                                                                                                                                                                              SOFTWARE: ASCI(DOS) Text only CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES: 15
CORRESPONDENCE ADDRESS:
ADDRESSEE: THOMAS G. PLANT 15(
STREET: LILLY CORPORATE CENTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
                                                                         FEATURE:
                                                                                                       FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                               FEATURE:
                                                                                                                                                                                                                               MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  597
                                                                                                                                      NAME/KEY:
LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ZIP:
                                                                                                                                                                                                                                                       LENGTH: 44377 base pairs
TYPE: nucleic acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE: FOR CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM Con
OPERATING SYSTEM:
SOFTWARE: ASCI(DO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET: LILLY CORPORTY: INDIANAPOLIS
                                                                                                                                                                                                                                               TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COUNTRY:
LOCATION:
              NAME/KEY:
                                                            NAME/KEY:
                                                                                         LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCCCGGAAGGTGCAGGCGCCTGGTGCGGGCCCGGAAG 767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gttcccgactccgccgggccccccggcgccgccggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGTGCGGGCCCGGAAGGTGCAGGCGCTGGTGCCGGGCCCCGGAAGGTGCCGGCGCTGGTGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccaccggctccgaacagcccggccgccgccgtcgccgccgagcccgcctgtgccggt 776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGCGCTGGTGCGGGCCCGGAAGGTGCAGGCGCTGCTGCTGCGGGCCCGGAAGGTGCCGGCGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gctgcgaccgccggcccgccggccaccgttgaagcctggcccgccggcccgccgat 716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGTGCCGGCGCTGCTGCCGGGCCCCGGAAGGTGCAGGCGCTGGTGCGGGCCCGGAAGGTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Application US/08804227C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Kuhstoss, Stuart A.
Rosteck, Paul R., Jr.
Sutton, Kimberly L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DeHoff, Bradley S.
                                         CDS
31329..36071
                                                                                                       CDS
                                                                                                                                      CDS
14046..20036
                                                                                                                                                                                   CDS
350..14002
                                                                                                                                                                                                                                               linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IBM Compatible SYSTEM: MS-DOS
36155..41830
                                                                                         20110..31284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                              February 21, 1997
                                                                                                                                                                                                                              DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              POLYKETIDE SYNTHASE GENES
                                                                                                                                                                                                                                                                                                                                                                                                                                                               US/08/804,227C
                                                                                                                                                                                                                                                                                                                                                                      X-8231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  610
```

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29268
28610 ACGAGGTCCAGCACCCGGCAGGCCACGGTGTGCGCGGTCGGCGGCGACGTCGCCGGTCCCC
                                                                                                                                                                                                                                                                                                                                             28910
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                29028
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              29388
                                                                                                                                                                                                                                                                                                         747
                                                                                                                                                                                                                                                                                                                                                                            687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        33 gccgccgtcaccgatcaacccgccggtgccgccggtgccgcctaccggccgcgccccg
               ccgccggcccgccggcttgcccggttccccggttgcgccgttggcgcgttgccgatcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                     cccgccctcaccgcccacgagttggttagcggtgccagttccgccggtgccggtccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGGGAGGAGGCGAGGTCGTCGGTGATGCCCATGGCGCGCAGGGCGTCCCACTTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GACGACGTCCGCGCGCGCACGTGCCGTCCGCTCCGGTGAAGGCGGTCGCGAAGTCGAGGGT 29509
                                                                                                                                                                                                                                                                                                                                                                                                           GAGGTCGGTGCCC--CGGCCCAGCCGCCAGGCACCGTCGTCGGGCGGGGTGAGCGGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gctgccaccggacccgccgatgccgccgtttggtccgcactggaggcgcgaaccc
                                                                 CGGGTGGCCACCACCAGGCGGCCCGTCCGGGCCCTCCGGGGCCGCGAGCCGGCCTGG
                                                                                     gggccgccggcctggccgggccccggccggccggccgttgccgtacagcagc
                                                                                                                                   CACGCGGCGGCCGGCCGGGTCGTCCACCTCGGCGTCGTCGCGTACGGCGACCGCGCCG
                                                                                                                                                          gggccgtcaccccggccccaccccgccccgccgttgccgaatagcccccgcgggctccacct
                                                                                                                                                                                                                        GTCTGCGGTTCGCCGGAGGCGAGGGCGTCGGTCAGCGCCCGGGCCGGACGCCGGGTCGTCG
                                                                                                                                                                                                                                                                                                gecgteg--eegeegageeegeetgtgeeggtgtteeegaeteegeeggggeeeeeeggeg
                                                                                                                                                                                                                                                                                                                                           TCCGTGCGGTCGGCCGCTCCAGCCGGGCACGTACACCGTCCCGGCCCGGACCGCG
                                                                                                                                                                                                                                                                                                                                                              gttgaagcctggccgccgccgccgatgccaccggctccgaacagcccggccgcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCCGGGCTCCAGCGCGCCTCCGGCGTCCGGGGCGCACCAGGGCGAGGCCGTCGAGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggagactccgaacccgccggcgccgccggcaccgccattggagaacagcccgccgccccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GACCTCGACGACGGTGCCGGCGCCCCTCCGTTCCCCATCTCCGCCTCGCCCCGGGTACATGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gccgttgccggtgaagatgccgccgtcgcctccggtgccgcgttccctccggccgagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCCGCCGTCCCACAGGCCGAGCACGCGGTCGCCGACGCGACACCGGTGACGCCGGGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGACCAGCCGTCCGGGACGGGGGCGAGCCAGCCGGTGGTCGGCCACGCACAGCGGGCCCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGTGACCAGACCGTAGTAGGCGCTGAGGAACACCGCGGGGACCGAGGCGGCCTGGGCGTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gacgctgtcgccggcggtaccgccggcggccggtcgccgatcagcttggcggccccgcc
                                                                                                                                                                                                    TCCAGGTCCACGAGCAGCAGCCGGCCCGGGCTCCTCGGCCTGCGCGGAGCGCAGCCAGGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        514;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 109.8; DB 2;
Pred. No. 5.2e-09;
0; Mismatches 607;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 44377;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10;
                               1044
                                                                                                                                                                                                                                                                                                                                           28851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28969
28551
                                                                 28611
                                                                                                                                   28671
                                                                                                                                                                    924
                                                                                                                                                                                                      28731
                                                                                                                                                                                                                                        864
                                                                                                                                                                                                                                                                         28791
                                                                                                                                                                                                                                                                                                         804
                                                                                                                                                                                                                                                                                                                                                                           746
                                                                                                                                                                                                                                                                                                                                                                                                            28911
                                                                                                                                                                                                                                                                                                                                                                                                                                            686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29089
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              29329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
              Best Local Similarity Matches 514; Conserv
                                               Query Match
```

γ

DЬ δÃ 밁 δÃ В

Qy

δõ

망 δÃ Qγ

В

Q

망

Q

Ъ

Q В γQ

밁

δ

ρ 밁 ρ Вþ

В

Conservative

0;

Mismatches

es 607; DB 2;

10;

Gaps

Ψ

Length 44377; Indels

9.5%; 45.4%;

Score 109.8; Pred. No. 5.2

Qγ 망 Q Дb δÃ

멍

```
; NAME/KEY:
; LOCATION:
US-08-804-198-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 15
US-08-804-198-1/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 1, Application Patent No. 5945320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                NFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             28490 CCGTCCGGGCCGGGAACGGCGGCGGCAGGTGGGCCGTCGGCCAGGCCAGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: Macintosh
OPERNTING SYSTEM: Macintosh
SOFTWARE: Microsoft Word 5.1
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1045 ggacgccccagcaacagctgggtgggcgtgttcacaatgttgagcaggccctccaacggc 1104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE OF INVENTION: NUMBER OF SEQUENCES:
                                             FEATURE:
                                                                         FEATURE:
NAME/KEY:
                                                                                                                                    FEATURE
                                                                                                                                                                                FEATURE:
                                                                                                                                                                                                                          FEATURE:
                                                                                                                                                                                                                                        MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                  SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                               TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                     CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET: LILL CTTY: INDIANAPOLIS
                                                           LOCATION:
                                                                                                                      NAME/KEY:
                                                                                                                                                  LOCATION:
                                                                                                                                                                                                            NAME/KEY:
                                                                                                                                                                                                                                                        STRANDEDNESS:
TOPOLOGY: li
                                                                                                                                                                                                                                                                                                                                                 TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                               REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                           NAME: CANTRELL, PAUL R. REGISTRATION NUMBER: 36
                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                        LOCATION:
                                                                                                                                                                    NAME/KEY:
                                                                                                                                                                                              LOCATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                    LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccgcggcggcggcctcagcgctcgcgtacgcgccagcagcgccgcagtaaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GCACGGACCGCGAACACGACGGCGTCCGGCGCCGGGCGTCCCGTCGGGGACGGCAGTGCG
                                                                                                                                                                                                                                                                                nucleic acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LILLY CORPORATE CENTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rao, Nagaraja R.
Richardson, Mark A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ROSteck, Paul R., Jr. /ENTION: PLATENOLIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Burgett, Stanley G. Kuhstoss, Stuart A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Burgett,
                                                                                                                                                                                                                                                       linear
                                                                                                     CDS
20110..31284
                                                                                                                                                  CDS
14046..20036
                                                                                                                                                                                             CDS
350..14002
               CDS
36155..41830
                                                         CDS
31329..36071
                                                                                                                                                                                                                                                                                                                                                 317-276-3885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PAUL R.
                                                                                                                                                                                                                                        DNA (genomic)
                                                                                                                                                                                                                                                                     single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Stanley
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US/08804198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CANTRELL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US/08/804,198
                                                                                                                                                                                                                                                                                                                                                                                        36,470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5.1
                                                                                                                                                                                                                                                                                                                                                                             P9113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SYNTHASE GENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1155
```

```
28968
28550 GCACGGACCGCGAACACGACGGCGTCCGGCGCCGGGCGTCCCGTCGGGGACGGCAGTGCG
                                                                                                                                                                                                              28670
                                                                                                                                                                                                                                                                                                                     28730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            28910 TCCGTGCGGTCGGCGGCCCGCTCCAGCCGGGCACGTACACCGTCCCGGCCCGGACCGCG 28851
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29028 GCCGGGCTCCAGCGGCGCCTCGGCGTCCGGGGCGGCCAGGGCCGAGGCCGTCGAGGGT 28969
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              29088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                29208 GCCGCCGTCCCACAGGCCGAGCACGCGGTCGCCGACGCGGCGACACCGGTGACGCCGGGGCC 29149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                29388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      29448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             33
                                  ggacgccccagcaacagctgggtggtggtgttcacaatgttgagcaggccctccaacggc 1104
                                                                                                                                                                                                                                               999ccgccggcctggccgggccccggacccgccggccccgccgttgccgtacagcagc 984
                                                                                                                                                                                                                                                                                                                                               gccgtcg--ccgccgagcccgcctgtgccggtgttcccgactccgccgggcccccccggcg 804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccctccggccgagcc 506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tecggtgececeggegecggegacegaacagtgegeeggeacegeegatgeegeegac 272
                                                                                                        ACGAGGTCCAGCACCCGGCAGGCCACGGTGTGCGCGTCGGCGGCGACGTCGCCGGTCCCG
                                                                                                                                ccgccggcccggcttgcccggtccccggtgcgccgttggcgcgttgccgatcagc 1044
                                                                                                                                                                                                            CGGGTGGCCACCACCAGGCGGGCGCCGTCCGGGCCCTCCGGGGCCGCGAGCCGGCGCTGG 28611
                                                                                                                                                                                                                                                                                                                  CACGCGGCGGCCGGGCGGCGTCGTCGGCGTCGTCGCGTACGGCGACCGCGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                     gttgaagcctggcccgccgccgccgatgccaccggctccgaacagcccggccgccc 746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAGGTCGGTGCCC--CGGCCCAGCCGCCAGGCACCGTCGTCGGGCGGGGTGAGCGGCCCG 28911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gccggtgccgccggtgccaccggtgcccccgttgacgctcaacccgccggtgccgccggc 626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAGGGCGATGAGGGCGTCGCGGAAGTTGACGCCCGCGGCGCGCGTACGGCGACGCGCACCTG 29029
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGTGACCAGACCGTAGTAGGCGCTGAGGAACACCGCGGGGGACCGAGGCGGCCTGGGCGTA 29269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gcctcctttgccgccggtgccgcggggtcgggcgccgagaccggttccggcggtgcc 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGGGCTCGCGGTGGCCAGCACCTCCGCGCCGAGGTGGCGGCCGATCTGCACCGCGGCCAT 29389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GACGACGTCCGCGCGGGACGTGCCGTCCGCTCCGGTGAAGGCGGTCGCGAAGTCGAGGGT 29509
                                                                                                                                                                                                                                                                                                                                                                                                                     TCCAGGTCCACGAGCAGGAACCGGCCGGGCTCCTCGGCCTGCGCGGAGCGCAGCAGGCCC 28731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTCTGCGGTTCGCCGGAGGCGAGGGCGTCGGTCAGCGCCCGGGCGGACGCCGGGTCGTCG 28791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ggagactccgaacccgccggcgccgccggcaccgccattggagaacagcccgccgccccc 566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GACCTCGACGACGGTGCCGGCGCCCTCCGTTCCCATCTCCGCCTCGCCCGGGTACATGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cccgcctcaccgccacgagttggttagcggtgccagttccgccggtgccgccggtccc 446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGGGAGGAGGCGAGGTGGTCGTCGGTGATGCCCATGGCGCGCAGGGCGTCCCACTTGCC 29449
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccgccgtcaccgatcaacccgccggtgccgcggtgccgcgctaccggccgcgccccg
                                                                                                                                                                                                                                                                                                                  28671
                                                                                                        28551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29089
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          92
```

8 B

Qγ

닿

Вb

δõ

۶ و م

1105 gccgcggcggcctcagcgctcgcgtacgcgccagcgcccgcagtaaag 1155

B 8

80

 밁

Db 28490 CCGTCCGGGCCGGGAACGGCGGGCAGGTCGGCCGCCTCGGCCAGG 28440

Search completed: January 12, 2001, 20:17:17 Job time: 26705 sec

•

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           length:
         10:
11:
12:
13:
14:
15:
15:
17:
17:
18:
19:
20:
                                                                                                                                                                                                                                                                                                                                                                          N_Geneseq_36:*

1: /SIDS6/gcgdata/geneseq/geneseqn/NA1980.DAT:*

2: /SIDS6/gcgdata/geneseq/geneseqn/NA1981.DAT:*

3: /SIDS6/gcgdata/geneseq/geneseqn/NA1982.DAT:*

4: /SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:*

5: /SIDS6/gcgdata/geneseq/geneseqn/NA1983.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-09-461-774-9
1161
1 aattegatgecagtecegee.....egecegeagtaaaggtttga 1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        January 12, 2001, 20:08:03;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           480022 seqs, 187831343 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IDENTITY_NUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd
/SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1989.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1991.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1991.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1992.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1993.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1994.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1994.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1995.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1997.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1999.DAT:*
                                                                                                                                                                                                                                                                                     /SIDS6/gcgdata/geneseq/geneseqn/NA1985.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1986.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1987.DAT:*
/SIDS6/gcgdata/geneseq/geneseqn/NA1988.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Search time 244.98 Seconds (without alignments) 1780.326 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  960044
```

score greater t Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result	score	Query Match	Query Match Length DB	DB	ID	Description
1	338.8	29.2	3946	18	T93610	Mycobacterium tube
2	269.6	23.2	2367	19	V64557	M. tuberculosis iπ
ω	269.6	23.2	2367	19	V44448	Mycobacterium tube
4	269.6	23.2	2367	20	Z19358	M. tuberculosis an
u	269.6	23.2	2367	20	219146	M. tuberculosis
о С	215.2	18.5	985	19	V64548	M. tuberculosis im
c 7	215.2	18.5	985	19	V44439	Mycobacterium tube
ი 8	215.2	18.5	985	20	Z19349	M. tuberculosis an
c 9	215.2	18.5	985	20	Z19137	M. tuberculosis
c 10	208.4	18.0	1164	20	X34250	Mycobacterium spec
c 11	208.4	18.0	1165	20	X34249	Mycobacterium
c 12	208.4	18.0	1166	20	X34248	Mycobacterium

Α.				0					1.3					4.3		٠,					0											
																					24											
132.8		•	•				•				٠		•	•	•	5	156.4		•		159.4		159.4	٠	٠.		•	168.4				189.4
							12.6					•	•	•		4	13.5	13.5	13.5	13.5	13.7	13.7	13.7				14.5	14.5	14.5	.9	16.3	
1165	1164	2367	2367	2367	2367	913	913	913	913	913	913	985	985	985	985	114955	538	538	538	538	1439	1439	1439	1439	3946	535	535	535	535	114955	6530	6530
20	20	20	20	19	19	20	20	19	19	18	18	20	20	19	19	20	20	20	19	19	20	20	19	19	18	20	20	19	19	20	20	14
X34249	X34250	Z19146	219358	V44448	V64557	Z19052	219264	V44354	V64462	T91413	T91476	Z19137	219349	V44439	V64548	X53491	Z19135	219347	V44437	V64546	Z19122	219334	V44424	V64533	T93610	z19126	Z19338	V44428	V64537	X53491	222072	Q51557
Mycobacterium spec	s i		M. tuberculosis an	_	M. tuberculosis im	M. tuberculosis re	M. tuberculosis an	_	M. tuberculosis im			M. tuberculosis re	M. tuberculosis an	cobacterium tu	M. tuberculosis im	Human adenosine Al		M. tuberculosis an	cobacterium tu	tuberculosis		M. tuberculosis an	cobacterium tu	M. tuberculosis im	cobacterium tu		M. tuberculosis an	cobacterium tu	M. tuberculosis im	Human adenosine Al	que	Loricrin gene. Ho

ALIGNMENTS

RESULT T93610 T93610 standard; DNA; 3946 BP

T93610;

27-APR-1998

(first entry)

Tuberculosis; mycobacteria; infection; diagnosis; antimycobacterial; antibiotic; vaccine; ss. Mycobacterium tuberculosis genomic DNA fragment (I).

Mycobacterium tuberculosis

W09741252-A2

06-NOV-1997.

18-APR-1997; 97WO-EP01973

29-APR-1996; 96DE-4017184.

(GBFB) GBF GES BIOTECH FORSCHUNG GMBH.

Espitia C, Honisch C, Moreno C, Singh M;

P-PSDB; W31852-55 WPI; 1997-549750/50.

New DNA and related proteins or RNA derived from M. tuberculosis used for diagnosis of mycobacterial infections, monitoring vaccination and development of anti-mycobacterial agents

Claim 1; Fig 9; 55pp; English.

```
Ş
                                                      В
                                                                                      Q
                                                                                                                          В
                                                                                                                                                       Qy
                                                                                                                                                                                                В
                                                                                                                                                                                                                             ρ
                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              New claimed DNA (A) has one of 3 isolated Mycobacterium
tuberculosis DNA sequences of 3946 bp (I) (T93610), 2653 bp (VI)
(see T93611) or 440 bp (IX) (see T93612), or hybridises to, or is a
claimed are RNA transcripts
of (A), and proteins encoded by (A). To isolate (I), a cosmid
clibrary of M. tuberculosis DNA was screened with degenerate probes
(see T93621) containing GC-rich regions and designed to encode part
of a proline-rich protein. (I) contains open reading frames (ORFs)
for 4 proteins (see W31852-55). These ORFs can be amplified and
cloned into vectors for expression in E. coli or other hosts.
Cloned into vectors for expression in E. coli or other hosts.
Clones (VI) and (IX) were obtained from a phage library and
together encode 3 proteins (see W31851 and W31856-57). The claimed
DNA sequences can be used for diagnosing tuberculosis and other
mycobacteria in (clinical) samples by hybridisation or
amplification, including differentiation between strains, as well
as for epidemiological studies, for monitoring vaccination or for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 719;
                                                                                                                            3220
                                                                                                                                                                                                  3160
                                                                                                                                                                                                                                                                                                                                           3040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                    474
                                                                                                                                                                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
gccagtcccgccggcgccaccagcgccgtcaccgatcaacccgccggtgccgccggt 68
                                                   ggccccaccggcccgccggagctgccggcccaccggatccgccgaccccgccggtggc
                                                                           ggtgccaccggtgcccccgttgacgctcaacccgccggtgccgcccggcaccgccggcggc
                                                                                                                      gtcggcgaacccgccatgcccgccggtgccgccggccgaacagaccgccagcgccacc
                                                                                                                                                                                                                  9CCtCC99T9CC9CCGttCCCtCC99CCG3agCCGgagagactCcgaacccgccggcgccgcc
                                                                                                                                                                                                                                                                                                                                                         gagcagcccagcgttgccgccggccgccggccgtctatgccgtcggccgtgagagt
                                                                                                                                                                                                                                                                                                                                                                                                                           ggggtcggggcgccgagaccggttccggcggtgccgccaatgccgccagcgccgaagag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gtcttgcccgccgtcggagaagccgaatccgccggcgccgccggagccgccggagccgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 accgaacagtgcgccggcaccgccgatgccgccgcccctttgccgccggtgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        accgatcagcccgggggtgccgccagcccaccgatcccgccgggggaagccctggacaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cccgccgttgccgccggtcaccg---cgctggcgccaccgttaccgccgttggcgccgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cccgcctgcgccgaacagccgccggccggccggccgactccgccgaagctgct
                                                                                                                                                                                                                                                                  attgccgccggccgtcccgccgccggcgaccaggctgtgtccgccgctgccgcttc
                                                                                                                                                                                                                                                                                                                                     accyccytccccaccyattccyccygcyccyccyccygcyccyagycyaycatyccygc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tccgccgttggcgccggcgccggagccgaagaccgtgccggtgttgcccccgggggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccaatcccaccgctaccgccgttaccgccattgccgatcaacacggcggtgccaccgat 2742
                                                                                                                                                                                                                                                                                    ggtgccagttccgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3946 BP; 518 A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  29.2%;
                                                                                                                                                         -ccgccattggagaacagcccgccgccccccgccggtgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1541 C; 1345 G; 542 T; 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 338.8; DB 18; Pred. No. 8.6e-35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 412; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -gatgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           176
                                                                                                                                                                                                3219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2979
                                                                                                                          3279
                                                                                                                                                                                                                                                                   3159
                                                                                                                                                                                                                                                                                                      473
                                                                                                                                                                                                                                                                                                                                       3099
                                                                                                                                                                                                                                                                                                                                                                          416
                                                                                                                                                                                                                                                                                                                                                                                                             3039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7;
```

```
RESULT
V64557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                              Immunogenic Mycobacterium tuberculosis polypeptide(s) and DNA to develop products for the detection of M. tuberculosis infection and for diagnosis, treatment and prevention of tuberculosis
                                                                                                                      Campos-Neto A, Dillo
Reed SG, Skeiky YAW,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3802
                                                                                                 WPI; 1998-261042/23.
                                                                                                                                                                                         13-MAR-1997;
11-OCT-1996;
                                                                                                                                                                                                                             07-OCT-1997;
                                                                                                                                                                                                                                                                                 WO9816646-A2
                                                                                                                                                                                                                                                                                                                               Tuberculosis; immunogenic; soluble;
vaccine; pharmaceutical; infection;
                                                                                                                                                                                                                                                                                                                                                                       M. tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                        V64557;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  V64557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3640
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3340
                                                                                                                                                                                                                                                                                                         Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                27-JAN-1999
                                                                                                                                                               (CORI-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ν
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgcggcggcggcgctcagcgctcgcgtacgcgccagcgcccgcagtaaaggtttg 1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            acgccccagcaacagctgggtgggcgtgttcacaatgttgagcaggccctccaacggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gaacagcccgccggcccgccgccgcccgcccgccgagtgcactgccgttcytgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            caccgcggcggcctcggcggcgcataggcgccgccaccggaggtcaatgcctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcgcccggtattcgccaggaag-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccgtccccgccattggccccggtgccggggggcgccgttggcgccgttgccgatcaacgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gccggccccgccggcttgcccggttccccggtgcgccgttggcgcgttgccgatcagcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccgccggc-----cgcgccggatcctccggcgccgccgttgacgattaaccagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccgccggcctggccggggccccggacccggcggtgccgttgccgtacagcagccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccgtcacccccggccccacccgccgccgttgccgaatagccccgcgggctccacctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccggagccgaacagccgccggccggcccggccggccagccggcgttgcccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccggcgccgccgcccgccgtgagggctactacgccgccgccggcggcgccgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccgtcgccgccgagcccggctgtgccggtgttcccgactccgccgggccccccggcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ggcgaccccgccagcgccgccgccgccgttgccgatgagcccgccggcggcgccgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gccggcgccgaacagcatggcgttgccgccggctccgccggacccgccgatcccactgct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tccgccggcccgactccggcggcgccgaagagcaggccggcgttgccggcagcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                  standard;
                                                                                                                                                               CORIXA CORP
                                                                                                                                                                                                                                                                                                                                                                                              (first
                                                                                                                                                                                       97US-0818112
96US-0730510
                                                                                                                                                                                                                             97WO-US18293
                                                                                                                                     Dillon
                                                                                                                                                                                                                                                                                                                                                                    immunogenic polypeptide RDIF7
                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA;
                                                                                                                                                                                                                                                                                                                                                                                              entry)
                                                                                                                          DC, Houghton R, Lode
Twardzik DR, Vedvick
                                                                                                                                                                                                                                                                                                                                                                                                                                                ВP
                                                                                                                                                                                                                                                                                                                                 antigen; protective
diagnosis; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -aactcgttgatcggatccagcagcggcga
                                                                                                                                     Lodes MJ
                                              tuberculosis intection
                                                                                                                                                                                                                                                                                                                                                                      DNA.
                                                                                                                                                                                                                                                                                                                                             immunity;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3690
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           986
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   806
```

4.

Page

194-195;

230pp; English

```
δõ
                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                              밁
                                                                         δã
                                                                                                     밁
                                                                                                                         ρy
                                                                                                                                                      Ъ
                                                                                                                                                                             δ
                                                                                                                                                                                                     Дb
                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8888888%&
  Б
                     QΥ
                                                  멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Ma
Best Loc
Matches
  1312
                                                                                                                                                       1132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This sequence encodes an immunogenic portion of a soluble Mycobacterium tuberculosis (MT) antigen which can be used in a method for inducing protective immunity against tuberculosis (TB). This sequence can be formulated into vaccines and/or pharmaceutical compositions for immunising against M. tuberculosis infection or may be used for the diagnosis of tuberculosis.
                                                                                                     1192
                                                                                                                                                                                                        1072
                                                                                                                                                                                                                                                           1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 2367 BP;
                                                                                                                                                                                 635
                         797
                                                                                                                                                                                                                                  584
                                                                                                                                                                                                                                                                                   524
                                                                                                                                                                                                                                                                                                           952
                                                                                                                                                                                                                                                                                                                                    464
                                                                                                                                                                                                                                                                                                                                                              892
                                                                                                                                                                                                                                                                                                                                                                                       409
                                                                                                                                                                                                                                                                                                                                                                                                                832
                                                                                                                                                                                                                                                                                                                                                                                                                                         350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  տ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Match
               caccggtgcccccgttgac--
                                                                                                                                                                                                                                                                                                                       tgccgccgtcgcctccggttgccgccgttcccgtccggcgagccggagactccggaacccgc
                                                                                                                                                                                                                                                                                                                                                                          ----tggttagcggtgccagttccgccggtgccggtcccgccgttgccggtgaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgggcgccgagaccggttccggcggtgcgccaatgcc-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tttggtccgcactggaggcgccgaaccctccggtgcccccgggcgccgcgggaccgaa--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccggcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgccgcccttgccgccatcaccacccttgccgccgaccacatcgggttctgcctcggggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cggtgccgccgctaccggccgcgccccggacgctgtcgccgccggtaccgccggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgatgccagtcccgccggcgccaccagcgccgccggtcaccgatcaacccgccggtgccgc
tgccgccgacaccgccgttgccgccgttgccccaccaccacccccgttcccaccggcac
                                                              cggccgcccgccgtcgccgagcccgcctgtgccggtgttcccgactccgccgggcc
                                                                                                  gattgaccccgtttgccccggcgaggccggcgccgccggtaccaccggcgccgccatggc
                                                                                                                                                   caccgatgccggacacatctgccgggctgtccccggtgctggccgggggccggggcgtgg
                                                                                                                                                                  caccggtcggcgtgccggcagtgccatggccgccgtgccgccgtcgccgtcgccggtttgat
                                                                                                                                                                                                                                                        cggcaccgccggtggccttgcccgagcctgccgtcgcggtggcaccgtcgccggtgc
                                                                                                                                                                                                                                                                       ctccgccgtcgccgttgccgccgccgccaccggcagcggcggtaccgccgtcaccac
                                                                                                                                                                                                                                                                                                                                                                                                                           cgaagaggatgccggcttgccgccgcccgcccgccgcccccccgcccacgagt-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gcaacccgccggcgccaccattgccgccagctccccctgcgccaccgtcggcgccggagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgccgtcaccaccgataccaccgcgccaccggcgccaccgttgccgccatcaccgaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ctgggctgtcaaacctcgcgatgccagcgttgccgccgcttcccccggggcccccccgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgaacagcccggcgttgccgccgttaccgcccgcacccccgatgcctgcggccacgctgg
                                                                                                                                                                                                                                                                                                                                                           caccgtcggacccgttgccaccatcaccgccaaaggcgctcgcaatgtcgccctgcgcga
                                                                                                                                                                                                                                                                                                                                                                                                               cgatgtgtacgaaagcgccgcctccggcgccgccgctaccacccccactgccggcggcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                cggcactggcagccccgttaccaccgaaaccgccgctaccaccggtagaggtggcagtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -cagtgcgccggcaccgccgatgccgccgccgcctctttgccgccggtgccgccggggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          al Similarity
692; Conser
                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          341 A; 1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23.2%;
                                                                                                                                                                                                                    -gctcaacccgccggtgccgccggcaccgccgg-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     269.6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9e-26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DΒ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            449;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ŧ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gccagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                       1131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         531
                       856
                                                 1311
                                                                                                                                                      1191
                                                                                                                                                                                                                                                          1071
                                                                                                                                                                                                                                                                                                          1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                64
                                                                                                     1251
                                                                                                                             736
                                                                                                                                                                               682
                                                                                                                                                                                                                                  634
                                                                                                                                                                                                                                                                                                                                   523
                                                                                                                                                                                                                                                                                                                                                              951
                                                                                                                                                                                                                                                                                                                                                                                       463
                                                                                                                                                                                                                                                                                                                                                                                                                891
                                                                                                                                                                                                                                                                                                                                                                                                                                         408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9;
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
        This DNA sequence codes for an antigenic portion (see W64377) Mycobacterium tuberculosis antigen RDIF7. It was isolated from Mycobacterium tuberculosis antigen RDIF7. It was isolated from Mycobacterium tuberculosis strain Erdman genomic DNA expression library urabbit anti-sera raised against M. tuberculosis fractionated proteins. Phage plaques expressing immunoreactive antigens we proteins.
                                                                                              New isolated Mycobacterium tuberculosis polypeptides and to develop products for the detection of M. tuberculosis and diagnosis of tuberculosis
                                                                                                                                                                          Campos-Neto A, I
Reed SG, Skeiky
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1432
                                                                                                                                                                                                                                                                                                                                                                                                                                                09-NOV-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      V44448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            V44448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1549
                                                                         Claim 11a; Page 207-209;
                                                                                                                                                                                                                                   13-MAR-1997;
11-OCT-1996;
                                                                                                                                                                                                                                                                   07-OCT-1997;
                                                                                                                                                                                                                                                                                        23-APR-1998
                                                                                                                                                                                                                                                                                                               WO9816645-A2
                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                    Tuberculosis;
                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tttg
                                                                                                                                                       1998-251292/22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gcagactccgctcaacagcggcttcagtgctggcataccgacccgcggccgcagtcaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccaacggcgccgcggcggcctcagcgctcgcgtacgcgccagcgcccgcagtaaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cgatcaacgggcgcccaaaagcgcctcggtgggcgcattcac---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgatcagcggacgcccagcaacagctgggtgggcgtgttcacaatgttgagcaggccct 1096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acagcaacccgccggccgccaggctgcccgggtgcc---gtcccgtcggcgccgtttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           acagcagcccgccggcccggcttgcccggtccccggtgcgccgttgcccttgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgcctccgctgccggtttgaccgaacccgccagccgccgttgccaccgttgccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgccggccgcggtaccaccggcccgccgttgccgcttgccgatcaacccggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgttgcccgggccgtcacccccggcccacccgccgccgttgccgaatagccccgcgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           standard; DNA; 2367
                                                                                                                                            W64377.
                                                                                                                                                                                                             CORIXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                (first
                                                                                                                                                                                                                                                                                                                                                                               tuberculosis strain Erdman
                                                                                                                                                                                                                                                                                                                                                                                                   infection; diagnosis; antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                          tuberculosis antigen
                                                                                                                                                                                                              CORP
                                                                                                                                                                                                                                   97US-0818111
96US-0729622
                                                                                                                                                                                                                                                                   97WO-US18214
                                                                                                                                                                                        Dillon
                                                                                                                                                                                                                                                                                                                                   /*tag=
                                                                                                                                                                             YAW,
                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers 713..1843
                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                       DC,
                                                                                                                                                                              Twardzik
                                                                                                                                                                                                                                                                                                                                     D
                                                                         250pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ВP
                                                                                                                                                                                       Houghton
                                                                                                                                                                              DR,
                                                                         English.
                                                                                                                                                                                                                                                                                                                                                                                                                          RDIF7
                                                                                                                                                                                       æ
                                                                                                                                                                              Vedvick
                                                                                                                                                                                                                                                                                                                                                                                                                           DNA
                                                                                                           DNA - used infection
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -cgcaccca
                                          from
                               using
                                                   9
                                          Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1548
```

proteins. purified.

expressing immunoreactive antigens were relates to compositions and methods for

compositions and

```
δÃ
                               В
                                                      δÃ
                                                                                        ₽
                                                                                                                  Qy
                                                                                                                                                  В
                                                                                                                                                                         Qy
                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                  Д
                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Ma
Best Loc
Matches
                                                                                                                                                                                                             1072
                                                                                                                                                                                                                                                                     1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       diagnosing tuberculosis. It provides polypeptides (see W64291-W64379) comprising antigenic or immunogenic portions of M. tuberculosis antigens, as well as DNA sequences encoding such polypeptides, recombinant expression vectors and transformed or transfected host cells. As oclaimed are methods and diagnostic kits for detecting M. tuberculosis infection in a patient using these polypeptides, antibodies or oligonucleotide probes and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
   797
                                                                                                                                                                                                                                                                                                                                                           464
                                                                                                                                                                                                                                                                                                                                                                                        892
                                                                                                                                                                                                                                                                                                                                                                                                                   409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match
Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               G
cggccgcccgccgtcgccgagccggcctgtgccggtgttcccgactccgccgggcc
                                                                                      gattgaccccgtttgccccggcgaggccggcgccgccggtaccaccggcgccgccatggc
                                                                                                                                                                                                                                                                                  tgccgccgtcgcctccggtgccgccgttccctccggccgagccggagactccgaacccgc
                            cgaacagcccggcgttgccgccgttaccgcccgcacccccgatgcctgcggccacgctgg
                                                                                                                                               caccyatgccggacacatctgccgggctgtccccggtgctggccgggggccggggcgtgg
                                                                                                                                                                          -----cggccaacacctcgaacagcccgctgcgaccgccggcccgccggcgc-----
                                                                                                                                                                                                                                     caccggtgccccgttgac--
                                                                                                                                                                                                                                                                                                                           ctccgccgtcgccgttgccgccgccgccaccggcagcggcggtaccgccgtcaccac
                                                                                                                                                                                                                                                                                                                                                                                   caccgtcggacccgttgccaccatcaccgccaaaggcgctcgcaatgtcgccctgcgcga
                                                                                                                                                                                                                                                                                                                                                                                                     ----tggttagcggtgccagttccgccggtgccgccggtcccgccgttgccggtgaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                           cgaagaggatgccggcttgccgcccgcccgccggccccgccctcaccgccacgagt-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             - cagtgcgccggcaccgccgatgccgccgccgccctttgccgccggtgccgccggggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ctgggctgtcaaacctcgcgatgccagcgttgccgccgcttcccccgggcccccccgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cytcyccyatcaycttygcygccccyccyctyccaccygacccyccyatgccyccygcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgatgccagtcccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgc
                                                                                                                                                                                                          caccggtcggcgtgccggtgccatggccgccgtgccgccgtcgccgccggtttgat
                                                                                                                                                                                                                                                                  cggcaccgccggtggccttgcccgagcctgccgtcgcggtggcaccgtcgccgccggtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                           cgatgtgtacgaaagcgccgcctccggcgccgcctaccacccccactgccggcggcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cggcactggcagcccgttaccaccgaaaccgccgctaccaccggtagaggtggcagtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgggcgcgcgagaccggttccggcggtgccgccaatgcc------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gcaacccgccggcgccaccattgccgccagctccccctgcgccaccgtcggcgcggagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgccgtcaccaccgataccacccgcgccaccggcgccaccgttgccgccatcaccgaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tgccgcccttgccgccatcaccacccttgccgccgaccatcgggttcctgcctcggggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cggtgccgccgctaccggccgcgccccggacgctgtcgccgccggtaccgccggcggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgccgccgttgccgccgcgccggccggtcccgccggcgccga---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            692;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity 57.5
92; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2367
                                                                                                      - caccgttgaagcctggcccgccggccgcgatgccaccggctccgaacagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23.2%; 57.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Α;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1016
                                                                                                                                                                                                                         -gctcaacccgccggtgccgccggcaccgccgg-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 269.6; D: Pred. No. 2.9e-0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                <u>ი</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            449;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Τ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -cgccaaggccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -gccagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                            1011
                                                                                        1251
                                                                                                                                                                                                                                                                  1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 531
                                                                                                                                                                                                                                                                                                                                                                                   951
                                                                                                                                                                                                                                                                                                                                                                                                                463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
```

```
Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                           Lodes
                                                                                                                                                     Campos - Neto
                                                                                                                                                                                                                                                                                    Mycobacterium tuberculosis; M. immunotherapy; diagnosis; immun immune response; skin test; ss
                                                                                                                                                                                                                                                                                                                                                                                                                                         1157
                                                                                                                         WPI; 1999-527409/44
                                                                                                                                                                                       05-MAY-1998;
18-FEB-1998;
                                                                                                                                                                                                                17-FEB-1999;
                                                                                                                                                                                                                                   26-AUG-1999.
                                                                                                                                                                                                                                                   WO9942076-A2
                                                                                                                                                                                                                                                                    Mycobacterium
                                                                                                                                                                                                                                                                                                                       M. tuberculosis antigen RDIF7 DNA sequence.
                                                                                                                                                                                                                                                                                                                                          05-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                            Z19358
                                                                                                                                                                                                                                                                                                                                                                                                                        1660
                                                                                                                                                                                                                                                                                                                                                                                                                                                           1600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1312
                                                                                               New antigens
                                                                                                                                                                     (CORI-) CORIXA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    917
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      857
                                                                                                                                                                                                                                                                                                                                                                                              4
                                                                                                                                                                                                                                                                                                                                                                                                                       cctg
                                                                                                                                                                                                                                                                                                                                                                                                                                         tttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgatcagcggacgccccagcaacagctgggtggtgttcacaatgttgagcaggccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        acagcagcccgccggcccgcccggcttgccccggtccccggtgcgccgttggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                          gcagactccgctcaacagcggcttcagtgctggcataccgacccgcggccgcagtcaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                acagcaacccgccggccgccaggctgcccgggtgcc---gtcccgtcggcgccgtttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgcctccgctgccggtttgaccgaacccgccagccgcgcgttgccaccgttgccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgccggccgcggtaccaccggccgccgttgccgcttgccgatcaacccggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cyttycccygyccytcacccccygccccacccgcccycgttyccgaatayccccycyg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tgccgccgacaccgccgttgccgcttgcccacaaccaccccccgttcccaccggcac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgatcaacgggcgccccaaaagcgcctcggtgggcgcattcac-
                                                                                                                                           , ĽM
                                                                                                                                                                                                                                                                                                                                                                            standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              = - = -
                                                                                                                  Y39174
                                                                                                                                                                                                                                                                                                                                                                                                                        1663
                                                                                                                                                                                                                                                                                                                                                                                                                                         1160
                                                                                                                                           Reed
                                                                                              from Mycobacterium tuberculosis useful in
                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                     tuberculosis
                                                                                                                                                                      CORP
                                                                                                                                                                                       98US-0072967
98US-0025197
                                                                                                                                                                                                                 99WO-US03268
                                                                                                                                           Dillon DC,
SG, Skeiky
                                                                                                                                                                                                                                                                                                                                                                            DNA;
                                                                                                                                                                                                                                                                                                                                                                            2367
                                                                                                                                                                                                                                                                                              immunisation;
                                                                                                                                                                                                                                                                                      SS
                                                                                                                                           Hendrickson RC,
YAW, Twardzik
                                                                                                                                                                                                                                                                                                        tuberculosis;
                                                                                                                                                                                                                                                                                              vaccine;
                                                                                                                                            DR,
                                                                                                                                           Houghton R. Vedvick
                                                                                                                                                                                                                                                                                             antigen; immunogen;
ine; infection;
                                                                                      in diagnostic compositions
                                                                                                                                            TS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -cgcaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      916
```

The present invention describes polypeptides comprising an immunogenic part of a Mycobacterium tuberculosis antigen (Ag). Also described are vaccines and fusion protein containing M. tuberculosis Ag's.

M. tuberculosis Ag's, DNAs encoding them, derived fusion proteins and other polypeptides fragments, can be used in pharmaceutical compositions or vaccines to generate a protective or therapeutic immune response to M. tuberculosis and as reagents in skin tests for Aircraft.

Claim 4; Page 190-192;

299pp; English ٥ŗ

and

protective

therapeutic

vaccines

or

secretion

```
멍
                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                         밁
                                                     δÃ
                                                                                     밁
                                                                                                              δõ
                                                                                                                                         В
                                                                                                                                                                                                   Вþ
                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                      õ
                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                          οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ᄝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
 Š
                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           32333×3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Ma
Best Loc
Matches
                                                                                                                                              1192
                                                                                                                                                                                                   1132
                                                                                                                                                                                                                                                            1072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tuberculosis. Ag can induce proliferation of, or cytokine by, T, B or natural killer cells and/or macrophages in tuberculosis-immune subjects. Z19249 to Z19460 and X39083 are used in the exemplification of the present invention.
                                                                                                                                                                                                                                                                                                                    1012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 2367 BP;
                                                                                     1252
  857
                                                                                                                 737
                                                                                                                                                                                                                                635
                                                                                                                                                                                                                                                                                         584
                                                                                                                                                                                                                                                                                                                                              524
                                                                                                                                                                                                                                                                                                                                                                           952
                                                                                                                                                                                                                                                                                                                                                                                                      464
                                                                                                                                                                                                                                                                                                                                                                                                                                    892
                                                                                                                                                                                                                                                                                                                                                                                                                                                               409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Match
                                                                                                                                                                                                                                                                       caccggtgcccccgttgac---gctcaacccgccggtgccggcggcaccgccgg-----
                                                                                                                                                                                                                                                                                                                                tgccgccgttcccggtgccgcgttccctccggccgagccggagactccgaacccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cggtgccgccgctaccggccgcgcccggacgctgtcgccgcggtaccgccggcgc
                                           gattgaccccgtttgccccggcgaggccggcgccgccggtaccaccggcgccgccatggc
                                                                                                                                                                                                caccgatgccggacacatctgccgggctgtccccggtgctggccgcggggccggggcgtgg
                                                                                                                                                                                                                  caccggtcggcgtgccggcagtgccatggccgccgtgccgccgtcgccgccggtttgat
                                                                                                                                                                                                                                                                                                                                                                        ctccgccgtcgccgttgccgccgccgccaccggcagcggcggtaccgccgtcaccac
                                                                                                                                                                                                                                                                                                                                                                                                                                 caccgtcggacccgttgccaccatcaccgccaaaggcgctcgcaatgtcgccctgcgcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cggcactggcagccccgttaccaccgaaaccgccgctaccaccggtagaggtggcagtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgggcgcgcgagaccggttccggcggtgccgccaatgcc------gccagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gcaacccgccggcgccaccattgccgccagctccccctgcgccaccgtcggcgccggagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctgggctgtcaaacctcgcgatgccagcgttgccgccgcttcccccgggcccccccgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cgatgccagtcccgccggcgccaccagcgccgccggtcaccgatcaacccgccggtgccgc
cgttgcccgggccgtcaccccggcccacccgccgccgttgccgaatagccccgcgg
                          tgccgccgacaccgccgttgccgcttgcccacaccaccccccgttcccaccggcac
                                                                                  cgaacagcccggcgttgccgccgttaccgcccgcacccccgatgcctgcggccacgctgg 1311
                                                                                                    cggccgcccgccgtcgccgacccgacccgcctgtgccggtgttcccgactccgccgggcc
                                                                                                                                                                                                                                                                                                                 cggcaccgccggtggccttgcccgagcctgccgtcgcggtggcaccgtcgccgccggtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                ----tggttagcggtgccagttccgccggtgccggtcccgccgttgccggtgaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgatgtgtacgaaagcgccgcctccggcgccgccgctaccacccccactgccggcggcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       cgaagaggatgccgccgcccgcccgcccgcccccgccctcaccgcccacgagt-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgccgtcaccaccgataccacccgcgccaccggcgccaccgttgccgccatcaccgaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tttggtccgcactggaggcgccgaaccctccggtgcccccggcgccgccgggaccgaa--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccggcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tgccgcccttgccgccatcaccatccttgccgccgaccatcagggttctgcctcggggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -cagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    al Similarity
692; Conserv
                                                                                                                                                       -caccgttgaagcctggcccgccggcccgccgatgccaccggctccgaacagcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         341 A; 1016 C; 683 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                23.2%; 57.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 269.6; DB 20; Pred. No. 2.9e-26; 0; Mismatches 449;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         327 T; 0 other
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                            1371
                                                                                                                                           1251
                                                                                                                                                                                                                                                                                                                                                                         1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               124
 916
                                                                                                                                                                                                                              682
                                                                                                                                                                                                                                                                                                                  1071
                                                                                                                                                                                                                                                                                                                                                                                                                                  951
                                                                                                                                                                                                                                                                                                                                                                                                                                                             463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9;
```

```
RESULT
Z19146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                 This invention describes novel recombinant antigens and their encoding nucleic acids derived from Mycobacterium tuberculosis. The novel polypeptides are useful for detecting M. tuberculosis infection in a biological sample by detecting antibodies which bind with the polypeptides, and are useful as vaccines for immunizing against M. tuberculosis infection. The new detection methods are needed as current vaccination strategies do not provide 100% immunity.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1157
                                                                                                                                                WPI; 1999-527416/44
P-PSDB; Y39031.
                                                                                                                                                                                                                                  05-MAY-1998;
18-FEB-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1037
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1372
 Sequence
                                                                                                        Claim
                                                                                                                         New polypeptide comprising antigenic portions
                                                                                                                                                                                        Campos-Neto A,
                                                                                                                                                                                                                                                                17-FEB-1999;
                                                                                                                                                                                                                                                                                     26-AUG-1999
                                                                                                                                                                                                                                                                                                                              Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                 M. tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                      05-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                           219146;
                                                                                                                                                                                                                                                                                                                                                                                                                                               219146 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1660 cctg 1663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   977
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tttg 1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgatcagcggacgccccagcagctgggtgggggtgttcacaatgttgagcaggccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acagcagcccgccggcccggcttgcccggttccccggttgcgccgttgccctgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgcctccgctgccggtttgaccgaacccgccagccgcgcgcttgccaccgttgccaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgccggccggcaggtaccaccggccgttgccgcgttgccgatcaacccggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gcagactccgctcaacagcggcttcagtgctggcataccgacccgcggccgcagtcaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acagcaacccgccggccgcgccaggctgcccgggtgcc--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgatcaacgggcgcccaaaagcgcctcggtgggcgcattcac----
                                                                                                        4.
                                                                                                                                                                                                              CORIXA
  2367
                                                                                                    Page 236-237; 323pp; English.
                                                                                                                                                                                                                                                                                                                                                 immunity;
                                                                                                                                                                                                                                                                                                                                                           diagnosis;
                                                                                                                                                                               Reed
                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
 BP;
                                                                                                                                                                                                                                                                                                                              tuberculosis
                                                                                                                                                                                                              CORP
                                                                                                                                                                                                                                98US-0072596
98US-0024753
                                                                                                                                                                                                                                                                 99WO-US03265
                                                                                                                                                                              Dillon DC,
SG, Skeiky
                                                                                                                                                                                                                                                                                                                                                                                recombinant antigen DNA encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA;
341 A;
                                                                                                                                                                                                                                                                                                                                                    SS
                                                                                                                                                                                                                                                                                                                                                            detection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                2367
  1016
                                                                                                                                                                               Hendrickson RC, YAW, Twardzik
c;
                                                                                                                                                                                                                                                                                                                                                            infection;
 683
G;
 327
                                                                                                                                                                                                                                                                                                                                                           antibody;
 Τ;
                                                                                                                                                                               Houghton R
R, Vedvick
                                                                                                                            of M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -gtcccgtcggcgccgtttc
0 other;
                                                                                                                                                                                                                                                                                                                                                                                 RDIF7
                                                                                                                            tuberculosis
                                                                                                                                                                                        R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -cgcaccca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1096
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1036
```

Query Match Best Local Similarity

57 57

. 5%;

Score Pred.

269.6; DB: No. 2.9e-26

20;

Length

Conservative

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                          1312
                                                                                                                                                                                                                                                                                                  1252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1012
                                                                                                                                                                                                                                                                                                                                    737
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      952
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  832
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             712
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              σı
                   acagcagcccgccggcccgccggcttgcccggtccccggtgcgccgttggcgccgttgc
                                                                                                                                                                                                                                                                                                                                                                   gattgacccgtttgaagcctggcccgccggccgccggtaccaccggctccgaacagcc
acagcaacccgccggccgcgccaggctgcccgggtgcc--
                                                                      cgcctccgctgccggtttgaccgaacccgccagccgcgcgcttgccaccgttgccaa
                                                                                                                                                                                                                                             cgccggccgccggtaccaccggcccgccgttgccgccgttgccgatcaacccggccg
                                                                                                                                                                 cgttgcccgggccgtcacccccggcccacccgccgccgttgccgaatagccccgcgg
                                                                                                                                                                                                                        tgccgccgacaccgccgttgccgccgttgcccacaaccacccccgttcccaccggcac
                                                                                                                                                                                                                                                                                                                   cggccgcccgtcgtcgccgacccgccgggcc
                                                                                                                                                                                                                                                                                                                                                                                                                                         caccgatgccggacacatctgccgggctgtccccggtgctggccgcggggccgggcgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----cggccaacacctcgaacagcccgctgcgaccggccggcccggcggcc-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caccggtcggcgtgccggcagtgccatggccgccgtgccgccgtcgccgccggtttgat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tgccgccgtcgcctccggtgccgcgttccctccggccgagccggagactccgaacccgc
                                                                                                                                                                                                                                                                                             cgaacagcccggcgttgccgcttaccgcccgcacccccgatgcctgcggccacgctgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ctccgccgtcgccgttgccgccgccgccaccggcagcggcggtaccgccgtcaccac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cgaagaggatgccggcgttgccgcccgcccgccggccccgccctcaccgcccacgagt-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cggcactggcagcccgttaccaccgaaaccgccgctaccaccggtagaggtggcagtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gcaacccgccggcgccaccattgccgccagctccccctgcgccaccgtcggcggcggagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccggcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cggcaccgccggtggccttgcccgagcctgccgtcgcggtggcaccgtcgccgccggtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        caccgtcggacccgttgccaccatcaccgccaaaggcgctcgcaatgtcgccctgcgcga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgatgtgtacgaaagcgccgcctccggcgccgccgctaccacccccactgccggcggcta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgggcgcgagaccggttccggcggtgccgccaatgcc------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -cagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgggggt 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cgccgtcaccaccgataccacccgcgccaccggcgccaccgttgccgccatcaccgaata
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tttggtccgcactggaggcgccgaaccctccggtgcccccggggccggcgggaccgaa--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ctgggctgtcaaacctcgcgatgccagcgttgccgccgcttcccccggggcccccccgtgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tgccgcccttgccgccatcaccacccttgccgccgaccacatcgggttctgcctcggggt 591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cggtgccgccgctaccggccccggacgctgtcgccgccggtaccgccggcgcgc 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cgatgccagtcccgccggcgccaccagcgccgccgttcaccgatcaacccgccggtgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --tggttagcggtgccagttccgccggtgccggccggtcccgccgttgccggtgaaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -gctcaacccgccggtgccgccggcaccgccgg-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                449;
-gtcccgtcggcgccgtttc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -gccagcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                1311
                                                                                                                                                                                                                                                                                                                                                                                                                                           1191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1011
 1548
                                  1036
                                                                                                                                                                                                                                                                                                                                                                     1251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9;
```

ρy

δõ

δÃ

망 δÃ 밁 Q Ъ δõ

δÃ

69

GTCGCCGGCCCGCCAGCACCGCCGGCGCCCCCGTTGCCCGCCATTGCCCGCCGCGGCGCCCCC

DЬ

642

Qy В

Вb ρ 밁 ρ Qy Ъ Ω В Qy Ъ Qy 밁 Q

```
RESULT
V64548/c
Вb
                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                         Query Match
Best Local S
Matches 414
                                                                                                                 This sequence encodes an immunogenic portion of a soluble Mycobac tuberculosis (MT) antigen which can be used in a method for induc protective immunity against tuberculosis (TB). This sequence can formulated into vaccines and/or pharmaceutical compositions for immunising against M. tuberculosis infection or may be used for t diagnosis of tuberculosis.
                                                                                             Sequence
                                                                                                                                                                                         Claim 4; Page 176; 230pp; English.
                                                                                                                                                                                                            Immunogenic Mycobacterium tuberculosis polypeptide(s) and DNA - us to develop products for the detection of M. tuberculosis infection and for diagnosis, treatment and prevention of tuberculosis
                                                                                                                                                                                                                                                         WPI; 1998-261042/23.
                                                                                                                                                                                                                                                                          Campos-Neto A, Dillon
Reed SG, Skeiky YAW,
                                                                                                                                                                                                                                                                                                                                13-MAR-1997;
11-OCT-1996;
                                                                                                                                                                                                                                                                                                                                                                07-OCT-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             M. tuberculosis immunogenic polypeptide XP25 3'-end
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27-JAN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             V64548 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1097
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1037
                                                                                                                                                                                                                                                                                                            (CORI-) CORIXA
                                                                                                                                                                                                                                                                                                                                                                                                         WO9816646-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Tuberculosis;
 702
                                        y Match 18.5%;
Local Similarity 58.5%;
hes 414; Conservative
                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6
cctg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccaacggcgccgcggcggcctccagcgctccgcgtacgcgccagcgcccgcagtaaagg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cgatcagcggacgccccagcaacagctgggtggtggtgttcacaatgttgagcaggccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gcagactccgctcaacagcggcttcagtgctggcataccgacccgcgggccgcagtcaacg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cgatcaacgggcgccccaaaagcgcctcggtgggcgcattcac----
                                                                                                                                                                                                                                                                                                                                                                                                                                                 osis; immunogenic; soluble;
pharmaceutical; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1160
                                                                                             BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                             CORP.
                                                                                                                                                                                                                                                                                                                                97US-0818112
96US-0730510
                                                                                                                                                                                                                                                                                                                                                                97WO-US18293
                                                                                             138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA;
                                                                                             A; 330
                                                                                                                                                                                                                                                                            DC, Houghton
Twardzik DR,
                                        Pred. No. 1.6e
0; Mismatches
                                                                                             Ç
                                                                                             423
                                                                                             G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  antigen; protective diagnosis; ss.
                                                                                                                                                                                                                                                                            R, Lodes Nedvick TS;
                                                                                             94
                                         .6e-19;
les 288;
                                                                                             Τ;
                                                              DВ
                                                                                             0
                                                             19;
                                                                                             other;
                                         Indels
                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                            immunity;
                                                                                                                                                                     Mycobacterium
                                         6,
                                         Gaps
 643
                    89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1096
                                                                                                                                                                                                                                                                                                                                                                                                                                                             TB;
                                          2
```

```
RESULT ,
V44439/C
TD V44439 standard; F
                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
   δõ
                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        뭥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                             Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
New isolated Mycobacterium tuberculosis polypeptides and to develop products for the detection of M. tuberculosis {\sf T}
                                                 Campos-Neto A, Dillon Reed SG, Skeiky YAW,
                                                                                                 13-MAR-1997;
11-OCT-1996;
                                                                                                                              07-OCT-1997;
                                                                                                                                                                                                                                                     09-NOV-1998
                                                                                                                                                  23-APR-1998
                                                                                                                                                                      W09816645-A2
                                                                                                                                                                                         Mycobacterium
                                                                                                                                                                                                             Tuberculosis;
                                                                                                                                                                                                                                Mycobacterium
                              WPI; 1998-251292/22.
                                                                               (CORI-)
                                                                                                                                                                                                                                                                                                                                                                                    108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      522
                                                                                                                                                                                                                                                                                                                                                                669
                                                                                                                                                                                                                                                                                                                                                                                                       609
                                                                                                                                                                                                                                                                                                                                                                                                                          165
                                                                                                                                                                                                                                                                                                                                                                                                                                              549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                129
                                                                                                                                                                                                                                                                                                                                              48
                                                                                                                                                                                                                                                                                                                                                                                                                                    gaacagcccgccgccggccggtgccgccggtgccaccggttgacgctcaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gccgcccgcccggccccgccctcaccgcccagtttggttagcggtgccagttcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccgagaccggttccggcggtgccgactgccgccagcgccgaagaggatgccggcgtt
                                                                                                                                                                                                                                                                                                                                                       gccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccggggtcgggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gtccgcactggaggcgccgaaccctccggtgccccgggcgcgccggggaccgaacagtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccgatcagcttggcggccccgccgctgccaccggacccgccgatgccggccatttg
                                                                                                                                                                                                                                                                                                                                             TTCTCCGCCGGCGCCGCCGAACCCGGCGCCACCGGTAGCGCTGCT 1
                                                                                                                                                                                                                                                                                                                                                                                   GGTGGG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGCCCCGCCGGCCGCCGCCCACCTGTGCCGCCGCCGCCACCGGCGAAACCAGCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCTGCACTACCGGTGGCGCCGACAACGCCGCCGGTGCCGCCGGTACCGGTCGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCGTCCCCGCCGTCGCCGCTTGCCGCCGGCCCGCCCGGCCCCGTTGATGCCGCCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGCCCCACCGTCACCGCCGACCCCGCCGTTGTCGCCGAGACCTGCGGCACCG---GTTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORIXA
                                                                                                                                                                                                                                                    (first
                                                                                                                                                                                                                                                                                                                                                                                                                         -GTTGTCCGCGCGGACCCGGCACCTCCGGTGCCGCCTTGCCGCCTGC
                                                                                                                                                                                                                                tuberculosis antigen XP25 3'
                                                                                                                                                                                                            infection; diagnosis;
                                                                                                                                                                                         tuberculosis strain Erdman
                                                                                CORP
                                                                                                 97US-0818111
96US-0729622
                                                                                                                              97WO-US18214
                                                                                                                                                                                                                                                                                             DNA;
                                                                                                                                                                                                                                                                                             985
                                                 DC, Houghton
Twardzik DR,
                                                                                                                                                                                                            antigen;
                                                 R, Lode
Vedvick
 DNA - use infection
                                                                                                                                                                                                                                                                                                                                                                                    49
                                                                                                                                                                                                                                                                                                                                                                                                                          109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                188
```

```
Вb
                                                                                                                          Qy
                                                                                                                                                          Dþ
                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                  δÃ
                                                                                                  DЪ
                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                   ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local Similarity Matches 414; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        extrapulmonary tuberculosis. It bears no similarity to known sequences. The invention relates to methods and compositions diagnosing tuberculosis. It provides polypeptides (see W64291-W64379) comprising an antigenic portion of a soluble M. tuberculosis antigen, or an immunogenic portion of a M. tuberculosis antigen, as well as DNA sequences encoding such tuberculosis antigen, as well as DNA sequences encoding such
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      polypeptides, recombinant expression vectors and transformed transfected host cells. Also claimed are methods and diagnos kits for detecting M. tuberculosis infection in a patient usithese polypeptides, antibodies or oligonucleotide probes and primers.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This is the 3' region of DNA coding for an antigenic portion of Mycobacterium tuberculosis antigen XP25; 5' DNA is provided in V44438. XP25 DNA was isolated from a M. tuberculosis strain Erdman genomic DNA expression library using sera from patients having extrapulmonary tuberculosis. It bears no similarity to known
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 4; Page 187-188; 250pp; English.
                669
                                                                                                                                                                                      489
                                                                                                                                                                                                                                              429
                                                                                                                                                                                                                                                                           345
                                                                                                                                                                                                                                                                                                                                    405
                                                                                                                                                                                                                                                                                                                                                               309
                                                                                                                                                                                                                                                                                                                                                                                              465
                                                                                                                                                                                                                                                                                                                                                                                                                          249
                                                                                                                                                                                                                                                                                                                                                                                                                                                       522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       642 GTCGCCGGCCCGCCAGCACCGCCGGCGCCCCGTTGCCCGCCATTGCCCGCGGCGCCCCC
                                                                                                   165
                                                                                                                                                                                                                   285
                                                                                                                                                                                                                                                                                                        369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               702 GCCCAAGCCGCCTTGGCCGCCTTGGCCGCCGCACCCTGGCCGCCGTTGAAATTGTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9 gccagtcccgccggccgccaccagcgccgtcaccgatcaacccgccggtgccgccggt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         diagnosis
gaacagccgccgcccccgccggtgccgccggtgccaccggttgcccccgttgacgctcaa
                                                                                                                                                                         gccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgcc
                                                                                                                                                                                                                                                                                           gccgcccgcccggcccggccctcaccgcccacgagttggttagcggtgccagttcc
                                                                                                                                                                                                                                                                                                                                                     gccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgtt
                                                                                                                                                                                                                                                                                                                                                                                                              gccggcaccgccgatgccgccgacgccaccctttgccgccggtgccgcgggggtcgggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gtccgcactggaggcgccgaaccctccggtgcccccggcgccgccgggaccgaaccgtgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTCGCCGGCCTTGGCTGTCAGGCCGACGCCCGCTTGCCCGCCGTTGCCCGGCGCGCCCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgatcagcttggcggccccgccgctgccaccggacccgccgatgccggccatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GGTGGG---
                                                                                                                                                                                                                                                                           GCCGGCGTGCCGGCCGGCCTTGGCCGCCTTGGCCGCCGTCAAAGCCGGAGAGGCC
                                                                                                                                                                                                                                                                                                                                                                                           GGCCCCACCGTCACCGCCGACCCCGCCGTTGTCGCCGAGACCTGCGGCACCG----GTTGC
                                           GGCCCGGCGGCGGCCGGCGCCACCTGTGCCGCCGGCGCGCCACCGGCGAAACCAGCACC
                                                                                                                                                                                                                   GCCTGCACTACCGGTGGCCGACAACGCCGCCGGTGCCGCCGGTACCGGTCGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of tuberculosis
                                                                                                   -GTTGTCCGCGCCGGACCCGCCGGCACCTCCGGTGCCGCCCTTGCCGCCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18.5%;
58.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Α,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            c;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pred. No. 1.6e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 215.2;
Pred. No. 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .6e-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Τ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       288;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and diagnostic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   985;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                              488
                                                                                                                                                                                                                                                                           286
                                                                                                                                                                                                                                                                                                        428
                                                                                                                                                                                                                                                                                                                                    346
                                                                                                                                                                                                                                                                                                                                                                                            406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          89
                                             49
                                                                                                                                                          166
                                                                                                                                                                                                                   226
                                                                                                                                                                                                                                                                                                                                                              368
                                                                                                                                                                                                                                                                                                                                                                                                                                                    466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 248
```

2:

밁

48

TTCTCCGCCGGCGCCGCCGAACCCGGCGCCACCGGTAGCGCTGCT

```
RESULT 8
Z19349/c
ID Z19349
                                                                                                                                                                                                                                                                                                                              Š
                                       용
                                                             δ
                                                                                          В
                                                                                                                Š
                                                                                                                                             В
                                                                                                                                                                    õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                   tuberculosis. Ag can induce proliferation of, or cytokine secretion by, T, B or natural killer cells and/or macrophages in tuberculosis immune subjects. Z19249 to Z19460 and Y39083 to Y39225
                                                                                                                                                                                                                                                                                                                                       other polypeptides fragments, can be used in pharmaceutical compositions or vaccines to generate a protective or therapeutic immune response to M. tuberculosis and as reagents in skin tests for diagnosis of
                                                                                                                                                                                                                                                                                                                                                                               The present invention describes polypeptides comprising an immunogenic part of a Mycobacterium tuberculosis antigen (Ag). Also described are vaccines and fusion protein containing M. tuberculosis Ag's.
M. tuberculosis Ag's, DNAs encoding them, derived fusion proteins and
                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         New antigens from Mycobacterium tuberculosis useful in diagnostic skin tests and protective or therapeutic vaccines or compositions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Campos-Neto A,
Lodes MJ, Reed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          05-MAY-1998;
18-FEB-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                17-FEB-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mycobacterium tuberculosis; M. tuberculosis; antigen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        M. tuberculosis antigen 3' XP25 DNA sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   05-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 1999-527409/44.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26-AUG-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (CORI-) CORIXA
                                                                                            642
                                                                                                                                             702
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  lmmunotherapy; diagnosis; immunisation; vaccine;
              189
                                                                                                                   69
                                                                                                                                                                      9
gtccgcactggaggcgcgaaccctccggtgcccccggcgcgccgcgggaccgaacagtgc
                                                       gccgatcagcttggcggccccgccgctgccaccggacccgccgattgccgccggccatttg
                                                                                                         gccgccgctaccggccgcgcccggacgctgtcgccgccggcggtaccgccggcggcggccgccgtc
                                                                                                                                                            gccagtcccgccggcgccaccagcgccgccgccgtcaccgatcaacccgccggtgccgccggt
                                        GTCGCCGGCCTTGGCTGTCAGGCCGACGCCCGCGTTGCCGCCGTTGCCGGCGGCGCCACC
                                                                                                                                              GCCCAAGCCGCCTTGGCCGCCTTGGCCGCCGCCACCCTGGCCGCCGTTGAAATTGTT
                                                                                          GTCGCCGGCCCAGCACCGCCGGCGCGCCCCTTGCCGCCATTGCCCGCGGCGCGCCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      response; skin test; ss.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    standard;
                                                                                                                                                                                                                                                               985 BP;
                                                                                                                                                                                                                                                                                        in the exemplification of the present invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                Page 171-172; 299pp; English.
                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98US-0072967
98US-0025197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99WO-US03268
                                                                                                                                                                                                                                                                138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Dillon DC, Hendrickson RC, H
SG, Skeiky YAW, Twardzik DR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DNA;
                                                                                                                                                                                                                                                                ۶,
                                                                                                                                                                                                            18.5%;
58.5%;
                                                                                                                                                                                                                                                                330 C;
                                                                                                                                                                                                0;
                                                                                                                                                                                                           Score 215.2; DB : Pred. No. 1.6e-19;
                                                                                                                                                                                                                                                                423 G; 94
                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                T; 0 other;
                                                                                                                                                                                                                         DB 20;
                                                                                                                                                                                                  288;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Houghton R; R, Vedvick
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   infection;
                                                                                                                                                                                                Indels
                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               immunogen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TS;
                                                                                                                                                                                               6;
                                                                                                                                                                                               Gaps
                                        523
                                                                 188
                                                                                          583
                                                                                                                   128
                                                                                                                                             643
                                                                                                                                                                      68
                                                                                                                                                                                               2
RESULT Z19137/c ID Z191 XX Z191 XX Z191 XX Z191 XX Anti KW Vacc XX Mycc XX Mycc XX Mycc XX Mycc PN W095 YX 26-4 XX 17-E PR 18-1 Lodk XX WPI Lodk XX WPI Lodk XX WPI Lodk XX WPI KX XX MPI Lodk XX WPI CC Nuc Yn New XX Clas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
nucleic acids derived from Mycobacterium polypeptides are useful for detecting M.
            This invention describes novel recombinant antigens and their encoding nucleic acids derived from Mycobacterium tuberculosis. The novel
```

```
M. tuberculosis recombinant antigen DNA encoding
Claim 4; Page 217; 323pp; English
                                                 WPI; 1999-527416/44
                                                                                     Campos-Neto A,
                                                                                                                                    05-MAY-1998;
18-FEB-1998;
                                                                                                                                                                         17-FEB-1999;
                                                                                                                                                                                                 26-AUG-1999.
                                                                                                                                                                                                                       W09942118-A2
                                                                                                                                                                                                                                                Mycobacterium
                                                                                                                                                                                                                                                                                                                                   05-NOV-1999
                                                                                                                                                                                                                                                                                                                                                             Z19137;
                                                                                                                                                                                                                                                                                                                                                                                    Z19137
                        New polypeptide comprising antigenic
                                                                         Lodes
                                                                                                            (CORI-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    249
                                                                                                                                                                                                                                                                                                                                                                                                                                               48
                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                               TTCTCCGCCGGCGCCGCCGAACCCGGCGCCACCGGTAGCGCTGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCCTGCACTACCGGTGGCGCCGACAACGCCGCCGGTGCCGCCGGTACCGGTCGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgtt 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgggggtcgggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cccgccggtgccgccggccggccggcggccaacacctcgaacagcccgctgcgaccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGTGGG----GTTGTCCGCGCCGGACCCGCCGGCACCTCCGGTGCCGCCCTTGCCGCCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGCCCCGGCGGCGCGCGCCACCTGTGCCGCCGGCGCCACCGGCGAAACCAGCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGCCCCACCGTCACCGCCGACCCCGCCGTTGTCGCCGAGACCTGCGGCACCG----GTTGC
                                                                         , LW
                                                                                                                                                                                                                                                                                                                                                                                    standard;
                                                                                                             CORIXA
                                                                                                                                                                                                                                                                      diagnosis;
immunity;
                                                                         Reed
                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                tuberculosis
                                                                                                              CORP
                                                                                                                                    98US-0072596
98US-0024753
                                                                                                                                                                         99WO-US03265
                                                                        Dillon DC,
SG, Skeiky
                                                                                                                                                                                                                                                                                                                                                                                    DNA;
                                                                                                                                                                                                                                                                         SS
                                                                                                                                                                                                                                                                                   detection;
                                                                                                                                                                                                                                                                                                                                                                                    985
                                                                                                                                                                                                                                                                                                                                                                                    ВÞ
                                                                        YAW, Twardzik
                                                                                                                                                                                                                                                                                   infection;
                        portions
                                                                                                                                                                                                                                                                                   antibody;
                                                                         DR,
                                                                        Houghton R. Vedvick
                          0f
                          <u>.</u>
                                                                                                                                                                                                                                                                                                            ω
                          tuberculosis
                                                                                                                                                                                                                                                                                     immunisation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               286
```

tuberculosis infection in

```
RESULT 1
X34250/c
   밁
                                                                                                                                                                 δõ
                                                                                                                                                                                           Вb
                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                  Вb
                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches 414;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          biological sample by detecting antibodies which bind with the polypeptides, and are useful as vaccines for immunizing against M. tuberculosis infection. The new detection methods are needed current vaccination strategies do not provide 100% immunity.
Secreted protein; Mycobacterium; hybridisation; detection; vaccin
                                 Mycobacterium
                                                      06-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 985
                                                                                                                                                                       669
                                                                                                                                                                                            108
                                                                                                                                                                                                                 609
                                                                                                                                                                                                                                       165
                                                                                                                                                                                                                                                           549
                                                                                                                                                                                                                                                                                225
                                                                                                                                                                                                                                                                                                     489
                                                                                                                                                                                                                                                                                                                          285
                                                                                                                                                                                                                                                                                                                                              429
                                                                                                                                                                                                                                                                                                                                                                   345
                                                                                                                                                                                                                                                                                                                                                                                       369
                                                                                                                                                                                                                                                                                                                                                                                                            405
                                                                                                                                                                                                                                                                                                                                                                                                                                309
                                                                                                                                                                                                                                                                                                                                                                                                                                                      465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            702
                                                                                                                   10
                                                                                                                                                    48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Similarity 58.5 nes 414; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Match
                                                                                                                                                                                                                                                                                                                                                                                                                        gccgagaccggttccggcggtgccgccaatgccgccagcggcgaagaggatgccggcgtt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccagtcccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgccggt
                                                                                                                                                              ACCGCCGGCCCCCGGAGCCGTTGGTGCCGCCACACCGCTGTTGCCGCCCCCCTCCCCC
                                                                                                                                                                                                                                                 gccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgcc
                                                                                                                                                                                                                                                                                                                                                                  gccgcccgcccggccccgccctcaccgcccacgagttggttagcggtgccagttcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgggggtcgggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gtccgcactggaggcgccgaaccctccggtgcccccggcgcgcccgggaccgaaccgttgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gccgccgctaccggccgccccggacgctgtcgccgccggtaccgccggcggcgccgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCCCAAGCCGCCTTGGCCGCCTTGGCCGCCGCACCACCTGGCCGCCGTTGAAATTGTT
                                                                                                                                                    TTCTCCGCCGGCGCCGCCGAACCCGGCGCCACCGGTAGCGCTGCT
                                                                                                                                                                                                      cccgccggtgccgccggcaccgccggcggccaacacctcgaacagcccgctgcgaccgcc
                                                                                                                                                                                                                                       GGTGGG--
                                                                                                                                                                                                                                                                                                                         GCCTGCACTACCGGTGGCGCCGACAACGCCGCCGGTGCCGCCGGTACCGGTCGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                            GGCCCCACCGTCACCGCCGACCCCGCCGTTGTCGCCGAGACCTGCGGCACCG---GTTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTCGCCGGCCCAGCACCGCCGGCGCGCCCCGTTGCCGCCATTGCCCGCGGCGCCCCC
                                                                                                standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BP; 138 A; 330 C;
                                                      (first
                                species nucleic acid sequence
                                                                                                                                                                                                                                     -GTTGTCCGCGCCGGACCCGCCGGCACCTCCGGTGCCGCCCTTGCCGCCTGC
                                                                                               DNA;
                                                     entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              18.5%;
terium; primer; vaccine; immun
                                                                                               ΒP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 215.2; DB 20
Pred. No. 1.6e-19;
Mismatches 288;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         423
cimer; PCR; amplification;
immunisation; infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        G; 94 T; 0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    288;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        as
                                                                                                                                                                                                                                                                                                                                             488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               68
                                                                                                                                                                                            49
                                                                                                                                                                                                                 399
                                                                                                                                                                                                                                     109
                                                                                                                                                                                                                                                                                166
                                                                                                                                                                                                                                                                                                    548
                                                                                                                                                                                                                                                                                                                        226
                                                                                                                                                                                                                                                                                                                                                                  286
                                                                                                                                                                                                                                                                                                                                                                                       428
                                                                                                                                                                                                                                                                                                                                                                                                          346
                                                                                                                                                                                                                                                                                                                                                                                                                               368
                                                                                                                                                                                                                                                                                                                                                                                                                                                    406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ν,
```

```
Q
                                                                                     밁
                                                                                                       δÃ
 밁
                                          밁
                                                            Qy
                                                                                                                               В
                                                                                                                                                Qy
                                                                                                                                                                          В
                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                          QY
                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                   Matches 491;
                                                                                                                                                                                                                                                                                                                                                                                                                        Sequences X34001-X34252 represent nucleic acids encoding secreted proteins from various Mycobacterium species microorganisms. The nucleotide sequences can be used as primers and probes for methods for detecting and identifying mycobacteria, especially belonging to the M. tuberculosis complex. The encoded proteins can be used in vaccines for immunisation against a bacterial or viral infection.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterial DNA vectors containing reporter constructs identifying coding or promoter sequences involved in infection-associated protein expression
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gicquel B,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11-SEP-1997;
14-AUG-1997;
 416
                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 1164 BP; 137 A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Guigueno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14-AUG-1998,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25-FEB-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   W09909186-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacterium
                                                                463
                                                                                      521
                                                                                                           403
                                                                                                                                578
                                                                                                                                                    343
                                                                                                                                                                           623
                                                                                                                                                                                                                                                                                                                             103
                                                                                                                                                                                                                                                               743
                                                                                                                                                                                              283
                                                                                                                                                                                                                     683
                                                                                                                                                                                                                                         223
                                                                                                                                                                                                                                                                                   163
                                                                                                                                                                                                                                                                                                                   gacccgccgatgccggccatttggtccgcactggaggcgccgaaccctccggtgccc
                                                                                                                                                                                                                                                                                                        CCGCCGGTGCCGGGGGGCGCCGTCGCCGCTTGCCGTATAGCTGGCCGCCAGCGCCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1999-181045/15
DB; Y04999.
CCGTCGCCGGCCCGCCGTTGCCGATCAGCCCACCGGCGCCCACCGGCGCGCCCATG
            atgccgccgtcgcctccggttgccgcgttccctccggccgagccggagactccgaacccg
                                                                                              acgagttggttagcggtgccagttccgccggtgccggtcccgccgttgccggtgaag
                                                                                                                               CCATTGCCGAAGAGGTGCCCTCCGGCACCGCCGCCGCCGCCGCCGCCGCCATTAGCG----
                                                                                                                                                                                     CCGGCGCCACCGTGGCCGATCAGCCTGGCGTCCCCACCGACGCCGCCGCCGCCACCGATA
                                                                                                                                                                                                                               ccggcgccgccggaccgaacagtgcgccggcaccggccgatgccgccgacgcctcctttg
                                                                                                                                                                                                                                                             TTCCCACCGGGCCGGCCGTCACGGCCAACCAAGGCTCCGGCGGCGGCGCCGGCACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22;
                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Fig 50C; 309pp; French.
                                        Lim
                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PASTEUR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       97FR-0011325
97FR-0010404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98WO-FR01813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              M
M
                                                                                    -AAACTGCTGTCTCCGCCGCGCGCGCCGCGCGCGCCGTGCCCGATCAGC
                                                                                                                                                                                                                                                                                                                                                           18.0%;
58.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pelicic V,
                                                                                                                                                                                                                                                                                                                                                                                                        368
                                                                                                                                                                                                                                                                                                                                                   0;
                                                                                                                                                                                                                                                                                                                                                                                                       Ç
                                                                                                                                                                                                                                                                                                                                                           Score 208.4; DB Pred. No. 1e-18;
                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                       517 G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Portnoi
                                                                                                                                                                                                                                                                                                                                                                                                       142 T; 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ď
                                                                                                                                                                                                                                                                                                                                                  306;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Goguet
                                                                                                                                                                                                                                                                                                                                                                      20;
                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              de
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              la Salmoniere
                                                                                                                                                                                                                                                                                                                                                   39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                ç
                                         417
                                                                                     474
                                                                                                         462
                                                                                                                                                   402
                                                                                                                                                                                                                                                                                                                             162
 357
                                                                                                                                520
                                                                                                                                                                          579
                                                                                                                                                                                                                                                              684
                                                                                                                                                                                                                                                                                                        744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Υ,
```

ģ

δÕ

583

ccaccggtgccccgttgacgctcaacccgccggtgccgccggcaccgcc--ggcggcca

58.7%;

6,

```
RESULT 1
X34249/c
ID 2342
XX 2342
XX 342
AC X342
AC X342
AC X342
XX Seci
DT 06-J
XX Seci
KW hybi
XX Mycc
XX Mycc
XX Mycc
XX Mycc
XX Mycc
XX Mycc
XX I1-1
PF 11-1
PF 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ΩV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            뫄
                                           Sequences X34001-X34252 represent nucleic acids encoding secreted proteins from various Mycobacterium species microorganisms. The nucleotide sequences can be used as primers and probes for methods for detecting and identifying mycobacteria, especially belonging to the M. tuberculosis complex. The encoded proteins can be used in vaccines for immunisation against a bacterial or viral infection.
    Sequence
                                                                                                                                                                                                                   Claim 22; Fig
                                                                                                                                                                                                                                                             Mycobacterial DNA vectors containing reporter constructs identifying coding or promoter sequences involved in infection-associated protein expression
                                                                                                                                                                                                                                                                                                                                                            WPI; 1999-181045/15
P-PSDB; Y04998.
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gicquel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (INSP ) INST PASTEUR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11-SEP-1997;
14-AUG-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14-AUG-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Secreted protein; Mycobacterium; hybridisation; detection; vaccino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           06-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25-FEB-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       X34249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccccacccgcccgccgttgccgaatagccccgcggctccacctgggccgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agcccgcctgtgccggtgttcccgactccgccggggcccccccggcgcgccgcggagccgaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           acacctcgaacagcccgctg-cgaccgccggccccgccggcgccaccgttgaagcctggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCACCGCCCGCACCGCCGTGACCGCCAGCCACGCCTGCGCCGACACCCCGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TTGGCATCGGCGCCGTTCCCGCCATTGCCACCGCCGCCGCCGCCGCCCCACAGCCCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            agcagccgccggccggccggccggccggcggtcgcccccgggccggtcacccccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCTGCCTGACCGGGCAGCGGTGGGCCCCCGGTACCACCGCCTTGCCCCGCGTGTCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGCCATCC----GCCACCGCCACCGGCACCGCCGAGGCCACCGTCTCCACCGCTGACGATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGCCGCCGAGGCCGATTGCGCCTTGTCCGCCGTGTCCGCCGGCCCGCCGTCGCCGTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCGCCGCCAGTACCCCACAGTCCGCGGCCGGCCGCCGCCGTGGCCCGCCGGCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        В,
                                                                                                                                                                                                                                                                                                                                                                                                                                  A.
       1165
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Lim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first
    BP;
                                                                                                                                                                                                                   50B;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             species
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             qs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97FR-0011325
97FR-0010404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98WO-FR01813
                                                                                                                                                                                                                                                                                                                                                                                                                                                        EM,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA; 1165
       138
                                                                                                                                                                                                                 309pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pelicic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nucleic acid sequence
    Α,
       368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      vaccine; immun
                                                                                                                                                                                                                   French.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ВP
    Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                        <
       517
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Portnoi D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           immunisation;
    <u>ი</u>
       142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PCR;
    Τ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Goguet
    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 amplification;
       other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        de
                                                                                                                                                                                                                                                                                                                                                                                                                                                        1a
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Salmoniere
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ss.
                                                                                                                                                                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      935
                                                                                                 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               297
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Κ,
```

Query Match

18

0%;

Score

208

. 4 ;

DB

20;

Length 1165

```
RESULT 12
X34248/c
ID X34248
δõ
                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Best Local Similarity Matches 491; Conserv
         Secreted protein; Mycobacterium; hybridisation; detection; vaccine
                                                 Mycobacterium species nucleic acid sequence
                                                                            06-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              417
                                                                                                                                                                                                                                                                                                      177
                                                                                                                                                                                                                                                                                                                                                       237
                                                                                                                                                                                                                                                                                                                                                                                                         297
                                                                                                                                                                                                                                                                                                                                                                                                                                 641
                                                                                                                                                                                                                                                                                                                                                                                                                                                             357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         463
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  804
                                                                                                                                                                                                                                                  120
                                                                                                                                                                                                                                                                                                                             760
                                                                                                                                                                                                                                                                                                                                                                               700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           103
                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                     acacetegaacageeegetg-egaeegeeeggeegeeeggegeeeegttgaageetgge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gacccgccgatgccggccatttggtccgcactggaggcgccgaaccctccggtgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ccgccggtaccgccgccgccgtcgccgatcagcttggcggccccccgccgctgccaccg
                                                                                                                                                                                              GCACCGCCCGCACCGCCGTGACCGCCAGCCACGCCTGCGCCGACACCCCGCCCCGCC
                                                                                                                                                                                                            gccccacccgccgccgttgccgaatagccccgcgggctccacctgggccgccggc 935
                                                                                                                                                                                                                                                  TTGGCATCGGCGCCTTCCCGCCATTGCCACCGCCGCCGCCGGCGCCCCACAGCCCGGCG
                                                                                                                                                                                                                                                               agcagcccgccggcccggcccgccagccagcgcgttgcccgggccgtcacccccg
                                                                                                                                                                                                                                                                                                                   agcccgcctgtgccggtgttcccgactccgccggggccccccgggggcccgcggagccgaac
                                                                                                                                                                                                                                                                                                                                                                                                        CCTGCCTGACCGGGCAGCGGTGGGCCCCCGGTACCACCGCCTTGCCCGCCGTGTCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ccaccggtgccccgttgacgctcaacccgccggtgccgccgcggcaccgcc--ggcggcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCGTCGCCGCCGGCCCGCCGTTGCCGATCAGCCCACCGGCGCCCACCCGCGGCGCCCATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccggcgccggcaccgccattggagaacagcccgccgcccccgccggtgccgctggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AT---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              atgccgccgtcgcctccggtgccgccgttccctccggccgagccggagactccgaacccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acgagttggttagcggttgccagttccgccggttgccggcggttgccgccgttgccggttgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCATTGCCGAAGAGGTGCCCTCCGGCACCGCCCGCCGCCGCCGCCGCCCATTAGCG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccgccggtgccgcggggtcgggcgcgagaccggttccggcggtgccgcaatgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCGGCGCCACCGTGGCCGATCAGCCTGGCGTCCCCACCGACGCCGCCGCCGCCGCCACCGATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccggcgccgcgggaccgaacagtgcgccggcaccggccgatgccgccgacgcctcctttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TTCCCACCGGGCCGCCGTCACGGCCAACCAAGGCTCCGGCGGGGTCCCCGGCACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCGCCGGTGCCGGGGGGGCGCCGTCGCCGCTTGCCGTATAGCTGGCCGCCAGCGCCCCCG
                                                                                                                                                                                                                                                                                                      AGCCATCC--
                                                                                                                              standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -GGCGTTCCCGCCGGCACCGCCTACTCCGGCGACCCCGCCGGACGCGCCGACACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                            (first
                                                                                                                                                                                                                                                                                                      -GCCACCGCCACCGGCACCGCCGAGGCCACCGTCTCCACCGCTGACGATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    - AAACTGCTGTCTCCGCCGGCGCGCGCGCGCGCCGTGCCCGATCAGC
                                                                                                                               1166
             vaccine;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. 1e-18;
0; Mismatches 306;
                        primer; PCR; amplification;
             immunisation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ACGGCTCCGCCGTGGCCGCCGGACCCG
             intection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     39;
                                                                                                                                                                                               տ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    640
                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                   699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           162
                                                                                                                                                                                                                                                                                                                                                                                759
                                                                                                                                                                                                                                                                                                                                                                                                          238
                                                                                                                                                                                                                                                                                                                                                                                                                                                             298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               358
```

```
Q
                                                                                                            В
                                                                                                                              Ş
                                                                                                                                                    밁
                                                                                                                                                                    Qy
                                                                                                                                                                                           Ъ
                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                            ρy
                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                            FX SX SSSSSSSX A
          S
                              밁
                                               δÃ
                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query
Best I
                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterial DNA vectors containing reporter constructs identifying coding or promoter sequences involved in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Guigueno
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gicquel B,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11-SEP-1997;
14-AUG-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     proteins
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (INSP)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           14-AUG-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25-FEB-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                            nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       infection-associated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO9909186-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium
           583
                               418
                                                                      475
                                                                                         463
                                                                                                             523
                                                                                                                                403
                                                                                                                                                    580
                                                                                                                                                                       343
                                                                                                                                                                                            625
                                                                                                                                                                                                                                   685
                                                                                                                                                                                                                                                     223
                                                                                                                                                                                                                                                                          745
                                                                                                                                                                                                                                                                                              163
                                                                                                                                                                                                                                                                                                                  805
                                                                                                                                                                                                                                                                                                                                      103
                                                                                                                                                                                                              283
                                                                                                                                                                                                                                                                                                                                                                    Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                 detecting and
                                                                                                                                                                                                                                                                                                                              cogecggtacegeeggeegeegtegeegateagettggeggeeeegeegetgeeaceg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1999-181045/15
DB; Y04997.
                                        atgccgccgtcgcctccggtgccgccgttccctccggccgagcccggagcccgaacccg
                                                                                                                      acgagttggttagcggtgccagttccgccggtgccgccggtcccgccgttgccggtgaag
                                                                                                                                                              CCGGCGCCACCGTGGCCATCAGCCTGGCGTCCCCACCGACGCCGCCGGCGCCCACCGATA
                                                                                                                                                                                                                                              ccggcgccgccggaccgaacagtgcgccggccgccgatgccgccgacgcctcctttg
                                                                                                                                                                                                                                                                         TTCCCACCGGGCCCGTCACGGCCAACCAAGGCTCCGGCGGGGGTCCCCGGCGCACCG
                                                                                                                                                                                                                                                                                                                 CCGCCGGTGCCGGGGGGGGCGTCGCCGCCGTTGCCGTATAGCTGGCCGCCAGCGCCCCCG
ccaccggtgccccgttgacgctcaacccgccggtgccggcagccaccgcc--ggcggcca
                                                                                                                                                   CCATTGCCGAAGAGGTGCCCTCCGGCACCGCCCGCCGCCGCCGCGCCATTAGCG---
                                                                                                                                                                                            CCGGTGTTGCCGGCCGTG---
                                                                                                                                                                                                                                                                                      gacccgccgatgccgccatttggtccgcactggaggcgccgaaccctccggtgccc
                                                                                                                                                                                                                                                                                                                                                          491;
                                                                                                                                                                                                                                                                                                                                                                                                                           ns from various Mycobacterium species microorganisms thide sequences can be used as primers and probes for tecting and identifying mycobacteria, especially beld tuberculosis complex. The encoded proteins can be used for immunisation against a bacterial or viral info
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INST
                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                            1166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              X34001-X34252 represent nucleic acids encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Fig 50A;
                                                                     Lim
                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PASTEUR.
                                                                                                                                                                                                                                                                                                                                                                                                            BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     зp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            97FR-0011325
97FR-0010404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           98WO-FR01813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EM,
                                                                                                            - AAACTGCTGTCTCCGCCGGCGCCGCCGCCGCCGCCGTGCCCGATCAGC
                                                                                                                                                                                                                                                                                                                                                                                                            138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 309pp;
                                                                                                                                                                                                                                                                                                                                                                    18.0%;
58.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protein expression
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pelicic
                                                                                                                                                                                                                                                                                                                                                                                                         Α;
                                                                                                                                                                                                                                                                                                                                                                                                         368 C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   French
                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                        Score 208.4; Pred. No. 1e-1:0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ۲,
                                                                                                                                                                                                                                                                                                                                                                                                         518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Portnoi
                                                                                                                                                                                           ----ACGGCTCCGCCGTGGCCGCCGGACCCG
                                                                                                                                                                                                                                                                                                                                                                   208.4; DB
No. 1e-18;
                                                                                                                                                                                                                                                                                                                                                                                                         ç;
                                                                                                                                                                                                                                                                                                                                                                                                           142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ď
                                                                                                                                                                                                                                                                                                                                                                                                         Τ,
                                                                                                                                                                                                                                                                                                                                                         306;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Goguet
                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                                                                                                                                                                                                                                             20;
                                                                                                                                                                                                                                                                                                                                                                                                           other;
                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      de
                                                                                                                                                                                                                                                                                                                                                                                                                             belonging
be used in
infection.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            for methods
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    la
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   secreted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Salmoniere
                                                                                                                                                                                                                                                                                                                                                         39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for
                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                 to
                                                                                                                                                                                                                                                                                                                                     162
          640
                              359
                                                                                                            476
                                                                                                                               462
                                                                                                                                                    522
                                                                                                                                                                       402
                                                                                                                                                                                           581
                                                                                                                                                                                                                                  626
                                                                                                                                                                                                                                                     282
                                                                                                                                                                                                                                                                          686
                                                                                                                                                                                                                                                                                                                746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ĸ
                                                                                                                                                                                                                                                                                                                                                        6;
```

```
RRSULT 1
QS1557 2
XX QS155 XX
XX QS155 XX
AC Q515 XX
DT 17-M
DT 17-M
DT LOTI
XX LOTI
XX LOTI
XX LOTI
XX LOTI
XX CATC
ET Misc Caps
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX Vagi
XX V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Loricrin; gene; constitutive; inducible; vector; 5' flanking region; intron; 3' flanking region; TATA bas; cap site; intron/exon boundary; DNA cassette; linker; restriction site; induction; human; psoriasis; epidermal cell; wound healing; ulcers; growth factor; antisense RNA; transforming growth factor beta; cytokine; skin; tracheal epithelia; cancer; E6; E7; papilloma virus; p53 protein; vaccine; oral epithelia; capsid protein; squamous epithelium; viral; oesophageal epithelia;
                    Constitutive and inducible vectors based on loricrin or K6 genes - for selective expression in the epidermis, ewound healing, treating psoriasis and skin cancer, etc.
                                                                                                                                                                                                                   (BAYU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q51557;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q51557
                                                                                                                                                                     Greenhalgh
                                                                                                                                                                                                                                                                      30-APR-1992;
                                                                                                                                                                                                                                                                                                                      28-APR-1993;
                                                                                                                                                                                                                                                                                                                                                                       11-NOV-1993.
                                                                                                                                                                                                                                                                                                                                                                                                                  WO9322431-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   misc_RNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             intron
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_RNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Loricrin gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     17-MAY-1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                     1993-368790/46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccccacccgccgttgccgaatagccccgcggcttccacctgggccgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTGGCATCGGCGCCGTTCCCGCCATTGCCACCGCCGCCGCCGCCGCCCCACAGCCCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               agcccgcctgtgccggtgttcccgactccgccggggcccccccggcgccgccggagccgaac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    acacctcgaacagcccgctg-cgaccgccggccggcggcgccaccgttgaagcctggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCTGCCTGACCGGGCAGCGGTGGGCCCCCGGTACCACCGCCTTGCCCGCCGTGTCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  agcagcccgccggcccgccggccagccggcgttgcccgggccgtcaccccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       standard;
                                                                                                                                                                                                                      BAYLOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          epithelia; cornal epithelia;
                                                                                                                                                                     DA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first
                                                                                                                                                                                                                      COLLEGE MEDICINE
                                                                                                                                                                                                                                                                      92US-0876286
                                                                                                                                                                                                                                                                                                                    93WO-US03993
                                                                                                                                                                Roop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -GCCACCGCCACCGGCACCGCGAGGCCACCGTCTCCACCGCTGACGATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /*tag= a
/note= "5'
1587..2677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Intron
4384..6530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ′*tag=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   entry)
                                                                                                                                                                     DR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6530
                                                                                                                                                                     Rothnagel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                flanking region'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               flanking
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ВP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          intron/exon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 region"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          transduction; transplant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          boundary"
                                             e.g.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     879
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     299
```

Claim 23;

26-32;

68pp;

English.

```
DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CC construction of the lorierin constitutive vector of the invention.

CC The lorierin vector has a 5' flanking region of approx. 1.5 kb. an CC intron of approx. 1.1 kb and a 3' flanking region of approx. 1.5 kb. CC The 5' flanking region of the lorierin gene comprises a TATA box.

CC cap site, first intron and intron/exon boundary, all in the correct CC order and position for expression of a nucleic acid cassette. The CC lorierin vector also comprises a 3' flanking region of the lorierin CC gene and a linker with a unique restriction site at the position of CC the start and stop codons, joining the two flanking sequences and CC also having a position for insertion of the DNA cassette (see also CC 951558). Vectors such as this can be used for; (a) in vitro induction CC of human epidermal cells, especially for stimulating healing of CC wounds, surgical incisions and ulcers, (where the vector expresses a CC growth factor), (b) treating psoriasis, (the vector expressing CC transforming growth factor beta, a soluble cytokine or antisense CC RNA), (c) treating skin cancer, (the vector expressing antisense RNA of the E6 or E7 gene of human papilloma virus or normal p53 protein), (d) for vaccination (the vector expresses a viral capsid protein, companied or cornal epithelia, the vector expresses antisense RNA). CC tracheal or cornal epithelia, the vector expresses antisense RNA). CC Alternatively human epithelial cells are transduced ex vivo, then
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                             3544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3844
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ocal Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Match
CTTCCACCGCCGCAGATAGCCGCCTCCGCAGCTGGAGCCACCGCCGCCACCAGAGTAC
                                ccgccgcccccgccggtgccgccggtgcccccggttgacgctcaacccgccg
                                                                                                                                                          ccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               agcttggcggccccgccgctgccaccggacccgccgatgccgccggccatttggtccgca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgccggtgccgccg
                                                                                                                         CCGCCGCAGCTGGATCCACCGCCACCTGAGTAGCCGCCGCCACAGCTAGAGCCGCCGCCTG
                                                                                                                                                                                                                                                   CCGCCACCGGAGGAACCACCTCCGCAGCTCGTGCCGCCGCCACCGGAATAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                             CCACCGCTAGAACCGCCTCCGTAGCTCTGGCACTGATACTGTTGGGACGATCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                              gccccgccggcccccccccccccccccccgagttggttagcggtgccagttccgccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAGTAGCCGCCACCGCAGCTGGAGCCTCCGCCCCCGGAGTAGCCGCCGCCGCCAGCTGGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcggttgccgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGCCGCAACTGGAGCCACCACCAGAGGAGCCGCCTCCGCAGCTAGAGCCTCCGCCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCAGAGGAGCCGCCGCCGCAGCTGCCACCGCCACCGCAATAGCCGCCGCCGCCGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ctggaggcgccgaaccctccggtgcccccggcgccgggaccgaacagtgcgccggca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCGCCAGAGGAGCCACCTCCACAGCTACCACCTCCTCCGGAAGAGCCCCCCTCCGTAGCTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ctaccggccgcgccggacgctgtcgccgccggtaccgccggcgcgccgccgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCACCGCAGCCACCGCTGCTGCCGCCACCACCGCTGGAGTAGCAGCCACCGCCGCCACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccgccgatgccgccgacgcctcctttgccgccggtgccgccggggtcgggcgcgcgaga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                509;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               e represents the loricrin gene and was used of the loricrin constitutive vector of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1635
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 189.4; DB 14; Pred. No. 1.5e-16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1696
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    G;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             511;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Η.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 6530;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3845
                                                            615
                                                                                                                                                                                                                                                   3425
                                                                                                                                                                                                                                                                                                             495
                                                                                                                                                                                                                                                                                                                                                                          3485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             يسر
٠٠
```

Š

3333333

8 Вb Š Вp Š

В δÃ В Qy 뫄 Qy В Qy 밁 γΩ 밁 Š

The specification describes a vector for the expression of a nucleic acid sequence in an epidermal cell, where the nucleic acid sequence not a mammalian loricrin gene or a mammalian K6 keratin gene. The ve

flanking region including

the sequences required in its

vector

S.

```
RESULT
Z22072/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3187
                                                                                                                                                                                           Greenhalgh DA,
                                                                                                                                                                                                                              (BAYU
                                                                                                                                                                                                                                                                 30-APR-1992;
29-OCT-1993;
                                                                                                                                                                                                                                                                                                                    01-NOV-1993;
                                                                                                                                                                                                                                                                                                                                                     28-SEP-1999.
                                                                                                                                                                                                                                                                                                                                                                                         US5958764-A.
                                                                                                                                                                                                                                                                                                                                                                                                                            Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                         surgical incision;
transgenic animal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Vector; epidermal cell; loricrin gene; K6 keratin gene; surgical incision; disease; psoriasis; cancer; alopecia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Z22072 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3067
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-NOV-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            796
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ે
                                                                                                                                                                                                                                                                                                                                                                                                                          вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCG

    gtgccgccggcaccgccggcggccaccacctcgaacagcccgctgcgaccgccggcccg

    |||||||

    |||||||

    ||||||

    |||||

    ||||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    |||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||

    ||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tacagcagcccgccggcccggcttgcccggtccccggtgcgcgttggcgcgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccgttgcccgggccgtcacccccggccccacccgccccgccgttgccgaatagccccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCCCCACCAGAGCCGCCACCGCCTCCACAGCTGGAGCCACCCCCGGAGTAGCTGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCGGAGGAGCCGCCGCAGCTAGAGCCGCCGCCGCCACCACCTCCGGAGTACTTGACG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccggccgccccgccgtcgccgagcccgcctgtgccggtgttcccgactccgccgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CAGTAGGAGCCGCCGCCTCCTGATCCGCCTCCGCAGCTGGAGCCGCCGCCGCCGCCG----CCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccggcgccaccgttgaagcctggcccggccggcccgatgccaccggctccgaacagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CAGCTAGAGCCACCGCCGCCTCCGGAGTACTTGACGCCCCCACCGGAGCCGCCTCCACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCCCCAGAGTAGCCACCGCCGCAGCTAGAGCCACCACCGCCTCCGGAGTAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGCAGCTGGAGCCGCCGCCGCCTCCGGAGTAGCCACCTCCGCAGCTGGAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sequence of the loricrin
                                                                                                                    vectors for expression
                                                                                                                                                                                                                              COLLEGE MEDICINE.
                                                                                                                                                                                                                                                                 92US-0876286
93US-0145388
                                                                                                                                                                                                                                                                                                                    93US-0146930
                                                                                                                                                                                           Rothnagel JA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                             disease;
                                                                                     25-32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               entry)
                                                                                                                                                                                           Roop
                                                                                   English.
                                                                                                                    in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                      epidermis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2948
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3068
```

3533333333333XX

```
expression; a 3' region from a mammalian loricrin or a mammalian K6 keratin gene which regulates expression (predominantly in an epidermal cell) of the nucleic acid sequence with which it is associated; and a linker connecting the 5' flanking region to the nucleic acid sequence, where the linker comprises a position for inserting the nucleic acid sequence and lacks the coding sequence of a gene with which it is naturally associated. The vector is able to encode a hormone, a growth factor, an enzyme, a clotting factor, an apolipoprotein, a receptor, a drug or an antigen. The vectors can be used to treat wounds or surgical incisions as well as diseases, such as pactions.
                                                      3187
                                                                                                                                                                                                                                                          3304
                                                                                                                                                                                                                                                                                                                                                          3364
                                                                                                                                                                                                                                                                                                                                                                                                                                                           3424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3664
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3724
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3784
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3844
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3904
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'n
       796
                                                                                                                                                                                                                                                                                                                                                                                                         556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16 ccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgccggtgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CACCGCAGCCACCGCTGCTGCCGCCACCGCTGGAGTAGCAGCCACCGCCGCCACCG
                                                                                                                                                                                 ccggcgccaccgttgaagcctggcccggccggcccgccgccgatgccaccggctccgaacagc
                                                                                                                                                                                                                                                       TTGCCGCCTCCGGAACCGCCGCCGCAGCCACCGGAGCTGCCGCCTCCAGAGGAGCCTCCG
                                                                                                                                                                                                                                                                                    gtgccgccggcaccgccggcggccaacacctcgaacagcccgctgcgaccgccggccccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGCCGCAGCTGGATCCACCGCCACCTGAGTAGCCGCCGCCACAGCTAGAGCCGCCGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAGTAGCCGCCACCGCAGCTGGAGCCTCCGCCCCCGGAGTAGCCGCCGCCGCCAGCTGGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcggttgccgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGCCGCAACTGGAGCCACCACCAGAGGAGCCGCCTCCGCAGCTAGAGCCTCCGCCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ctggaggcgccgaaccctccggtgcccccggcgccgggaccgaacagtgcgccggca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCGCCAGAGGAGCCACCTCCACAGCTACCACCTCCTCCGGAAGAGCCCCCCTCCGTAGCTC
cccccggcgcccgcagccgaacagccagcccgccggcccggcccggccagccgcg
                                                    CCGGAGGAGCCGCCGCCAGCTAGAGCCGCCGCCGCCACCACCTCCGGAGTACTTGACG
                                                                                   CAGTAGGAGCCGCCGCCTCCTGATCCGCCTCCGCAGCTGGAGCCGCCGCCGCCGCCG----CCC
                                                                                                                                                                                                                                                                                                                                                        CTTCCACCGCCGCCGGAATAGCCGCCTCCGCAGCTGGAGCCACCGCCGCCACCAGAGTAC
                                                                                                                                                                                                                                                                                                                                                                                                    ccgccgccccggtgccgctgtgccaccggtgcccccgttgacgctcaacccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ccggccgagccggagactccgaacccgccggcgccgccggcaccgccattggagaacagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGCCACCGGAGGAACCACCTCCGCAGCTCGTGCCGCCGCCACCGGAATAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccgttccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCACCGCTAGAACCGCCTCCGTAGCTCTGGCACTGATACTGTTGGGACGATCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccccgccggccccccccccccccgagttggttagcggtgccagttccgccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCAGAGGAGCCGCCGCCGCAGCTGCCACCGCCACCGGAATAGCCGCCGCCGCCGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TGCTGGGGGGGCCAGGAGGTCTGACTGGTCTGCTGAGAGGAGTAATAGCCCCCCTCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             agcttggcggccccgccgctgccaccggacccgccgatgccgccggccatttggtccgca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ctaccggccgcgccggacgctgtcgccgccggtaccgccggcggccgccgatc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          509;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6530 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      incisions as well as diseases, such as psoriasis, cancer, to create transgenic animals for assessing human disease
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1635 A; 1507 C; 1696 G; 1692 T;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 present sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 189.4; DB 20
Pred. No. 1.5e-16;
0; Mismatches 511;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              represents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  0 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   loricrin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                       3188
                                                                                                                                                                                                                                                     3245
                                                                                                                                                                                                                                                                                                      675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3545
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3665
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3845
                                                                                                                                                                                                                                                                                                                                                                                                       615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ۲,
```

밁

Qγ

δÃ В δÃ DЬ Q DЬ δÃ

Вþ Ş 밁

Вp

δõ 밁 δõ В Ş B Qy 망 Ş В

directed against at least 2 mRNAs selected from target genes, coding and non-coding regions of RNAs corresponding to target genes, gene initiation codons, genomic flanking regions, intron-exon borders, the 5'-end, the 3'-end and the juxta-section between coding and non-coding regions and all segments of RNAs encoding proteins associated with one or more diseases, conditions or mixtures. The antisense oligonucleotides may be derived from sequences x5572-74. These multiple target oligonucleotides (specifically X55180-271) can be used for the antisense treatment of diseases and conditions. Typical diseases and conditions

The specification describes antisense oligonucleotides (X52869-X55271) directed against at least 2 mRNAs selected from target genes, coding a

δõ B

```
RESULT 1
X53491/c
Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3127
                                                                                                                                                                                                                                    09-JUN-1998;
17-SEP-1997;
                                                                                                                                                                                                                                                                                                                                                                       chronic Obstructive pulmonary disease; leukemia; lymphoma; colon cancer; breast cancer; lung cancer; pancreatic cancer
                                                                                                                                                                                                                                                                                                                                                                                                          acute asthma; allergy; asthma; impeded respiration;
respiratory distress syndrome; pain; cystic fibrosis;
                                                                                                                                                                                                                                                                                                                                                                                                                               impaired respiration; inflammation; lung disease;
pulmonary vasoconstriction; inflammation; allergic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1036
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3007
                                                                                                                                                 New antisense oligonucleotides used
                                                                                                                                                                      WPI; 1999-229400/19
                                                                                                                                                                                                               (UYEC-) UNIV
                                                                                                                                                                                                                                                                     17-SEP-1998;
                                                                                                                                                                                                                                                                                         25-MAR-1999
                                                                                                                                                                                                                                                                                                              WO9913886-A1
                                                                                                                                                                                                                                                                                                                                                        prostate cancer;
                                                                                                                                                                                                                                                                                                                                                                  hepatocellular carcinoma; kidney
                                                                                                                                                                                                                                                                                                                                                                                                pulmonary hypertension; pulmonary vasoconstriction;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Antisense oligonucleotide; multiple
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                05-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           X53491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2947
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ဥ၁၁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CAGCTAGAGCCACCGCCGCCTCCGGAGTACTTGACGCCCCCACCGGAGCCGCCTCCACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCGCAGCTGGAGCCGCCGCCGCCTCCGGAGTAGCCACCTCCGCAGCTGGAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCCCCACCAGAGCCGCCACCGCCTCCACAGCTGGAGCCACCCCGGGGTAGCTGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tacagcagcccgccggcccggcttgcccggtccccggttgcccgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CCCCCAGAGTAGCCACCGCCGCAGCTAGAGCCACCACCGCCTCCGGAGTAGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ccgftgcccggccgtcaccccggcccacccgccgccgttgccgaatagccccgcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           adenosine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2885
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1038
                                                                                                                 Page
                                                                                                                                                                                                                EAST CAROLINA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                   98US-0093972
97US-0059160
                                                                                                                                                                                                                                                                     98WO-US19419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Al receptor antisense oligonucleotide fragment.
                                                                                                                37; 120pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNA;
                                                                                                                                                                                                                                                                                                                                                                  cancer;
                                                                                                                                                 in
                                                                                                                                                                                                                                                                                                                                                                                                                                                      target; antisense
                                                                                                                                                                                                                                                                                                                                                                  melanoma;
                                                                                                                                                                                                                                                                                                                                                                 hepatic metastasis;
                                                                                                                                                e.g. pulmonary
                                                                                                                                                                                                                                                                                                                                                                                       carcinoma;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        975
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2888
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
  108072 AGCCAGGCGCCGCCCCGCCNHNNNSGGGGCCCVAGGCGAGCCAGGCGCCGCCGCC
                                                                                                  108132 NNHNNNSGGCCCVAGGCGAGCCAGGCGCCGCCGCCCCCCCCNNHNNNSGGGCCCVAGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             108372 GCCGCCCCCCCCCCNNHNNNSAGGCGAGCCAGGCGCCGCCCCCCCCCCCNNHNNNSVAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    108552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            108612
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   108726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          108786
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               108846
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        are those associated with impaired respiration and inflammation, including lung diseases, pulmonary vasoconstriction, inflammation, allergic rhinitis, acute asthma, allergies, asthma, impeded respiration, respiratory distress syndrome, pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, chronic obstructive pulmonary disease (COPD), and cancers such as leukemias, lymphomas, carcinomas e.g. colon cancer, breast cancer, lung cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, hepatic metastases, as well as all types of cancers which may metastasize or have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 114955 BP; 6071 A; 29417 C; 36712 G; 21328 T; 21427 other;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     metastasized to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local Similarity
                             gtgttcccgactccgccgg-gccccccggcggcgcggagccgaacagcagcccgccggc
                                                                                                                                        atgccaccggctccgaacagcccggccgccgccgccgccgagcccgcctgtgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ttccctccggccgagccggagactccgaacccgccggcgccgccggccaccgccattggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccagtcccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgccggtg 69
                                                                                                                                                                                                            CAGGCGCCGCCCCCCCCCNNHNNNSGCCCVAGGCGAGCCAGGCGCCGCCGCCCCCCCCC
                                                                                                                                                                                                                                                        GCCNNHNNNSCCVAGGCGAGCCAGGCGCCGCCGCCCCCCCNNHNNNSCCCVAGGCGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                      GCGAGCCAGGCGCCGCCCCCCCCCNNHNNNSCVAGGCGAGCCAGGCGCCCCCCCCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ccgccgcccgccggcccgccctcaccgcccacgagttggttagcggtgccagttccg 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tccgcactggaggcgccgaaccctccggtgcccccggcgccgccgggaccgaacagtgcg 249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCGCCNNHNNNSGCCGCCCCCGCCNNHNNNSCGCCGCCCCCCCCNNHNNNSCCGCCGCCC 108727
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCCCGNNHNNNSGGGGCCCVAGGCGAGCCAGGCGCCGCCGCCCCCCCNNHNNNSCCGCCC 108787
                                                                                                                                                                                                                                                                                                                                                            ccgttgacgctcaacccgccggtgccggcaccgccggcggccaacacctcgaacagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       aacagcccgccgccggtgccgccggtgcca-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCCCCGCCNNHNNNSGCGAGCCAGGCGCCGCCGCCCCCCCCNNHNNNSGGCGAGCCAGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGCCNNHNNNSGAGCCAGGCGCCGCCGCCCCCCCCNNHNNNSCGAGCCAGGCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CCCGCCNNHNNNSGCCAGGCGCCGCCGCCCCCCCCNNHNNNSAGCCAGGCGCCGCCGCCC 108493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGCCCCCGCCNNHNNNSCAGGCGCCGCCGCCCCCCCCCCNNHNNNSCCAGGCGCCGCCGCC 108553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgggggtcggggcg 309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccyatcaycttygcygcccyccyctyccaccygacccyccyatyccyccygccatttyg 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    453;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the lungs, including breast and prostate cancer.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          14.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 173.4; DB 20; Pred. No. 6.8e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 595;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 114955;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -ccggtgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  108373
                                                                                                                                                     774
                                                                                                                                                                                                                                                                                                                                                                     654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            594
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          108433
108013
                                                                                                    108073
                                                                                                                                                                                                            108133
                                                                                                                                                                                                                                                                                                                 108193
                                                                                                                                                                                                                                                                                                                                                                                                                      108253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4:
```

밁 S рЬ Ş Вb Š В δ Qγ

Ş

Ş В

В Q õ

Ş

δĀ

Ş

Š

8888888888888888888

```
밁
                        Ş
                                                  B
                                                                         29
                                                                                                     В
                                                                                                                            Qy
                                                                                                                                                        밁
                                                                                                                                                                                Qy
                                                                                                                                                                                                           망
                                                                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                     Qy
107712
                                                  107772
                                                                                                     107832
                                                                                                                                                        107892
                                                                                                                                                                                                            107952
                                                                                                                                                                                                                                                             108012
                         1127
                                                                           1067
                                                                                                                              1007
                                                                                                                                                                                                                                    887
                                                                                                                                                                                 947
                                                                                                                                                                                                                                                                                      834
cceecceec
                                                                                                   HNNNSCCGGGCCGGGCCAAGCNNHNNNSCCGGGCCGGGCGGGCAAGCCNNHNNNSCC
                                                                                                                                                       GGGCGGGCANNHNNNSCCGGGCCGGGCGGGCAANNHNNNSCCGGGCCGGGCGGCAAGNN 107833
                                                                                                                                                                                                                                                                               cccgccggccccgccagccgcgtt------gcccgggccgtcacccccggcccac
                                                                                                                                                                                                                           tcgcgtacgc
                                                  GGGCCGGGCGGCAAGCCGNNHNNNSCCGGGCCGGGCGAAGCCGGNNHNNNSCCGGG 107713
                                                                                                                                                                              ccceggacccgccggcccgccgttgccgtacagcagcccgccggcccgccggcttgcc 1006
                                                                                                                                                                                                          tgggcgtgttcacaatgttgagcaggccctccaacggcgccgcggcggcggcctcagcgc
                                                                                                                            cggtccccggtgcgccgttggcgcgttgccgatcagcggacgccccagcaacagctggg
107703
                                                                                                                                                                                                                                  946
                                                                           1126
                                                                                                     107773
                                                                                                                                                                                                          107893
```

Search completed: Job time; 26480 se January 12, 2001, 20:09:56

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OM nucleic - nucleic search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ..
     January 12, 2001, 20:08:02; Search time 6876.06 Seconds (without alignments) 864.115 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapop 10.0 , Gapext 1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-461-774-9
1161
1 aattcgatgccagtcccgcc.....cgcccgcagtaaaggtttga 1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GenEmbl: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1118133 seqs, 2558875100 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IDENTITY_NUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gb_on: *
gb_ov: *
gb_pl: *
gb_pl: *
gb_pl: *
gb_pl: *
gb_pr: *
gb_pr: *
gb_pr: *
gb_or: *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gb_ba1:*
gb_ba2:*
em_om:*
em_ov:*
em_ov:*
em_ph:*
em_ph:*
em_ph:*
em_ph:*
em_lo:*
em_vi:*
em_vi:*
em_un:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2236266
```

;																																			
	84: 85:					78.					72:								63:				л O O O									48.	46:	45:	44:
	gb_htg24:* gb_pr8:*	htg0:*	b_pat1	b_sts2:	sts1	b_pr6	_htg1	m_htg	m_htg8:	ba i	b vi	ם ל	b_htg22	b_htg21	b_htg	htg19	b_htg1	hum6	اہا	htq	m htg	in htg4	b_neg1	b_in3:	b_ht	b_htg1	b_htg12	b_htq11	b htg	b htq9	hta	777	m_hum	m_htg	g 2

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

_		_			Ω							0		0		_	0		^		, R	
21	20	19	18	17		15	14	13	12	11	10		89	`-	6			ω	2		Result No.	
326.4	328	328.6	332.6	336.2	338.4	338.8	338.8	340.6	341	343.6	344.4	347.8	360.8	367.2	376.4	377.4	413.2	413.4	1045	1156.2	Score	
28.1	28.3	28.3	28.6	29.0	29.1	29.2	29.2	29.3	29.4	29.6	29.7	30.0	31.1	31.6	32.4	32.5		35.6	90.0	99.6	Query Match	*
40838	53662	11700	40163	68848	28826	3946	3946	37586	67200	29550	39150	38900	40790	47852	31300	68848	56414	30850	37036	32514	Length	
2	Ŋ	N	N	N	2	81	بر	N	ผ	2	N	N	N	N	2	N	ν	N	N	2	DB	
MTY25D10	MTV016	MTCI418B	MTCY28	MTV043	MTV041	A93410	AF071081	MTCY270	MTV017	MTV039	MTCY21B4	MTCY63	MTCY493	MTV023	MTV035	MTV043	MTV002	MTCY1A11	MSGY151	MTCY130	ID	
Z95558 Mycobacteri	AL021841 Mycobacte	Z96071 Mycobacteri	Z95890 Mycobacteri	AL022004 Mycobacte	AL021958 Mycobacte	A93410 Sequence 6	AF071081 Mycobacte	Z95388 Mycobacteri	AL021897 Mycobacte	AL021942 Mycobacte	Z80108 Mycobacteri	Z96800 Mycobacteri	Z95844 Mycobacteri	AL022022 Mycobacte	AL021930 Mycobacte	AL022004 Mycobacte	AL008967 Mycobacte	<pre>z78020 Mycobacteri</pre>	AD000018 Mycohacte	z73902 Mycobacteri	Description	

			REFERENCE	JOURNAL MEDLINE REMARK	TITLE	REFERENCE AUTHORS	SOURCE	N ON		C 44 234. 45 232.	43					ωω • 4- π	32 291.8 33 289.2		28			c 22 322 23 320.6
Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web. (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS habeen renumbered from the original cosmid submissions but the ogene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes	Tuberculosis sequencing and mapping teams, Sanger Centre, Trust Genome Campus, Hinxton, Cambridge CB10 15A Unite de Moleculaire Bacterienne, Institut Pasteur, 28 rue du Doctev 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk Unium 27, 1998 this sequence version replaced gi:1340081.	Direct Submission Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium	12;396(6707):190]] 2 (bases 1 to 32514) Parkhill.T	Nature 393 (6685), 537-544 (1998) 98295987 Erratum:[[published erratum appears in Na	Deciphering the biology of Mycobacterium tuberculosis complete genome sequence	l (bases 1 to 32514) Cole,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C., Harris,D., Gordon,S.V., Eiglmeier,K., Gas,S., Barry III,C.E., Harris,D., Gordon,S.V., Eiglmeier,K., Gas,S., Barry III,C.E., Tekaia,F., Badcock,K., Basham,D., Brown,D., Chillingworth,T., Connor,R., Davies,R., Devlin,K., Feltwell,T., Gentles,S., Hamlin,N., Holroyd,S., Hornsby T., Jagels,K., Krogh,A., McLea Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A., Rajandream,M.A., Rogers,J., Rutter,S., Seeger,K., Skelton,S., Squares,S., Squares,R., Sulston,J.E., Taylor,K., Whitchead,S.	Mycobacterium tuberculosis. Mycobacterium tuberculosis Mycobacterium tuberculosis Bacteria; Firmicutes; Actinobacteria; Actinobacteridae Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium.	MTCY130 32514 bp DNA BCT MYCODACterium tuberculosis H37Rv complete genome; Z73902 AL123456 Z73902.1 GI:3261576	ALIGNMENTS	4 20.2 40806 4 20.0 40221	8 20.2 121125 2	2 21.3 41230	6 21.8 16150	22.4 24244 2	24.3 40163 2 MTC	24.8 22440 2	25.1 8189 2 24.9 42061 2	25.8 40051 2	26.8 25949 2	27.1 16150 27.0 69350	27.4 35946 27.3 20270	27.7 67200 2 27.6 36021 2
the Sanger Centre are tuberculosis/) CDS have submissions but the old the new gene numbers. tkov Model of TB genes	apping teams, Sanger Centre, Wellcome Cambridge CBIO 15A Unite de Genetique Ltut Pasteur, 28 rue du Docteur Roux, 8-mail: parkhill@sanger.ac.uk version replaced gi:1340081.	lf of the Mycobacterium		Nature 1998 Nov	tuberculosis from the	r,T., Churcher,C., ,S., Barry III,C.E., , Chillingworth,T., ,T., Gentles,S., ,K., Krogh,A., McLean,J., ,Quail,M.A., eger,K., Skelton,S., or,K., Whitehead,S. and	; Actinobacteridae; Mycobacteriaceae;	BCT 17-JUN-1998 e genome; segment 59/162.		AD000016 Mycobacte AD000002 Mycobacte	AL022121 Mycobacte	z81368 Mycobacteri	2/3906 Mycobacteri ALO21999 Mycobacte	z95557 Mycobacteri	z95890 Mycobacteri	ALO21006 Mycobacte 285982 Mycobacteri	AL022075 Mycobacte AD000019 Mycobacte	AD000004 Mycobacte	Z95387 Mycobacteri	AL021999 Mycobacte AL009198 Mycobacte	<pre>277724 Mycobacteri 295207 Mycobacteri</pre>	AL021897 Mycobacte 283859 Mycobacteri
						······································									-	-						

```
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             rRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          initiation codon
                                /translation="MHDDEERCYRAIQSKDAREDGWFVVAVLTTGVYCRPSCPVRPPF ARNVRFLPTAAAAQGEGFRACKRCRPDASPGSEWNVRSDVVARAMRLIADGTVDRDG VSGLAAQLGFTTRULEFLQAVVGAGPLALKAQRWQTAVLLETTNLPGGDVAFAAG FSSIRQFNDTVRLACDGTPTALRARAARFESATASAGTVSLRLPVRAPFAFEGVFGH LAATAVPGCEBVRDGAYRRTLSLLFWGWGIVSLTPADDHVRCLLVLDDFRDLMTATARC RRLLDLDADDEAIVBALGADDPLRAVVGKAFGGRIFRTVDEARFAVRANCHAQQVSTAR RRTLDLLDADDEAIVBALGADDPLRAVVGKAFGGRIFRTVDEARFAVRANCHAQQVSTARA ASTHAGRIVAAAYGRPVHDRHGALTHTFPSIEQLAEIDPGHLAVPKARQRTINALVASL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="Rv1317c, (MTCY130.02c), len: 496. alkA, similarity to 3MG2_ECOLI p04395 dna-3-methyladenine glycosidase ii, (282 aa), FASTA scores, opt: 437, z-score: 508.8, E(): 8.6e-22, (32.8% identity in 293 aa overlap), also similar to ada proteins e.g. ADA_SALTY p26189 ada regulatory protein (352 aa), fasta scores: E(): 5.3e-08, 35.9% identity in 156 aa overlap; contains PS00041 Bacterial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 methylated-dna--protein-cysteine methytransferase simito many e.g. OGT_HAEIN P44687 to many e.g. OGT_HAEIN P44687 methylated-dna--protein-cysteinemethytransferase (190 FASTA scores, opt: 405, z-score:475.1, E(): 6.5e-20, (41.9% identity in 155 aa overlap); contains PS00374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  methyltransferase active site" complement(4226. .5716)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /protein_id="CAA98103.1"
/db_xref="GI:1340082"
/db_xref="SWISS-PROT:Q10627"
/db_xref="SWISS-PROT:Q10627"
/translation="MHYRTIDSPIGPL/TLAGHGSVLTNLRMLEQTYEDSRTHWTPDP
/translation="MHYRTIDSPIGPL/TLAGHGSVLTNLRMLEQTYEDSRTHWTPDP
GAFSGAVDQLNAYFAGELTEFDVELDLRGTDFQQRVWKALLTIPYGETRSYGEIADQI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    M.tuberculosis 5S rRNA, len: 116"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(4226. .5716)
/gene="alkA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(3840. .3860)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAPGAARAVGLANGHNPIAIIVPCHRVIGASGKLTGYGGGINRKRALLELEKSRAPAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Methylated-DNA--protein-cysteine methyltransferase active
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(3732. .4229)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(3732. .4229)
/gene="ogt"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /organism="Mycobacterium
/strain="H37Rv"
/db_xref="taxon:1773"
/clone="Y130"
ADKSLVLDAGCDWQRARGQLLALPGVGPWTAEVIAMRGLGDPDAFPASDLGLRLAAKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 regulatory proteins, araC family signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="ogt"
/note="Rv1316c, (MTCY130.01c),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="55 rRNA, identical to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                /db_xref="SWISS-PROT:Q10630"
                                                                                                                                                                                                                                                                                                            /protein_id="CAA98104.1"
/db_xref="GI:1340083"
                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
/product="alkA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="alkA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="PS00374 Methylated-DNA--protein-cysteine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="ogt"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="ogt"
                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          note="23S rRNA gene, approximate coordinates"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .32514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ne methytransferase similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    len: 165. Probable
```

```
gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        'gene="Rv1318c"
complement(5797..7422)
/gene="Rv1318c"
/gene="Rv1318c"
/gene="Rv1318c"
/note="Rv1318c, (MTCY130.03c), len: 541. Some similarity
/note="Rv1318c, (MTCY130.03c), len: 541. Some similarity
/note="Rv1318c, (MTCY130.03c), pt: 270, z-score: 320.9,
19485(193 aa), FASTA scores, opt: 270, z-score: 320.9,
E(): 2.5e-11, (28.8% identity in 184 aa overlap), similar
to MTCY130.04c, FASTA scores, opt: 2505 z-score: 2174.6
E(): 0, 71.0% identity in 534 aa overlap, also similar to
MTCY130.05c, FASTA scores, opt: 2423 z-score: 2103.6 E():
0, 68.7% identityin 534 aa overlap"
complement(9112...10815)
/gene="Rv1320c"
complement(9112...10815)
/gene="Rv1320c"
complement(9112...10815)
/gene="Rv1320c, (MTCY130.05c), len: 567. Some similarity
/note="Rv1320c, (MTCY130.05c), len: 567. Some similarity
/note="Rv1320c, (MTCY130.05c), len: 567. Some similarity
at the C-terminus to adenylate cyclase eg CYAA_RHIME
p19485(193 aa), FASTA scores, opt: 277. z-score: 340.8,
E(): 2e-12, (34.0% identity in 156 aa overlap), similar
to MTCY130.03c, FASTA scores, opt: 24.32 z-score: 2501.4
E(): 0 (68.7%identity in 534 aa overlap), similar to
MTCY130.04c, FASTAscores opt: 2334 z-score: 2430.3 E(): 0,
(66.3% identity in 534 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
/product="hypothetical protein Rv1318c"
/protein_id="CAA98105.1"
/protein_id="CAA98105.1"
/protein_id="CAA98105.1"
/db_xref="GI:1340084"
/db_xref="GI:1340084"
/db_xref="SWISS-PROT:010631"
/translation="MSAKKSTAORLGRVLETVTROSGRLPETPAYGSWLLGRVSESOR
RRRVR10VMLTALVYTANLLGIGVALLLVTIA:PEPSIVRDTPRRLTFGYVPGYVLLA
LALGSYALTROTVQALRWAIEGRKPTREEERRTFLAPWRVAVGHLMFWGVGTALLTTL
YGLINNAFIRRFLFAVSFCGVLVATATYLHTEFALRPFAAQALEAGPPRRLAPGILG
RTMVVWLLGSGVPVVGIALMAMFEMYLLUTRMQFATGVLIISMVTLVFGFTILMWILA
WLTATTVRVVVAALARRVERGELETNLVVFDGTELGELQRGFNAMVAGLREBERVRDLF
GRHYGREVAAAAERERSKLGGEETRHVAVVFIDIVGSTOLVTSRPPADVVKLLNKFFRI
GRHYGREVAAAAERERSKLGGEETRHVAVVFIDIVGSTOLVTSRPPADVVKLLNKFFRI
GRHYGREVAAAAERERSKLGGEETRHVAVVFIDIVGSTOLVTSRPPADVVKLLNKFFRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /translation="marktmagriggaletmtrocgqlpetpaygswilgrvsbsps rrwrt krivtyimtantigivvallvyterppvbsiytdrowwvteqvapayatla laigtywittrivrasirwaferpapsystdrowwvteqvapayatla laigtywittrivrasirwaferpapsysdrowtllefrvaavhlilwdiggallat Lyglanryffilesyticgylvatkoylftepalroyakallagrapparkaleagrapyiilesyticgylvatkoylftetqlasavlilsittlifgfluwwit krymylgastapvavlluhnltetqlasavlilsittlifgfluwwil krymylgastropgdlyvbdgfelgelorgflumvnglrererprilegrivaril rgrivarilegropgdlasavlilsittliffraktropgartyvbaltyvbdgfelgelorgflumvnglrererprilegrivardlegrivarapprvvbaltererprilegrivaryfolgestydlumpaatyvklrereraivvbengvarappropahtyvklrereraivvbengvaragoivargovgaroffelgrivagarleglarshaltegrafilassbtihaase terahgelgytlrghegryvvgkpvnqaarleglakshparllassbtihaase terahgelgetytlrghegrivvgkpvnqaarleglakshparllassbtihaase terahgelgetytlrghegrivaravpf"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv1319c, (MTCY130.04c), len: 535. Some similarity at c-terminus to adenylate cyclase eg CYAA_HHME p19485 (193 aa), FASTA scores, opt: 254, z-score: 303.4, E(): 2.4e-10, (33.3% identity in 144 aa overlap), similar to MTCY130.03c, FASTA scores, opt: 2505 z-score: 2651.4 E(): 0, (71.0% identity in 534 aa overlap), similar to MTCY130.05c, FASTA scores, opt: 2354 z-score: 2491.6 E() 0, (66.3% identity in 534 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(7492..9099)
/gene="Rv1319c"
complement(7492..9099)
/gene="Rv1319c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /transl_table=11
/product="hypothetical protein
/protein_id="CAA98106.1"
/db_xref="GU:1340085"
/db_xref="SWISS-PROT:Q10632"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ERARWSLGRHVKLRGHDQPVRLAKPVGLTKPRR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VVDEVDRHHGLVNKFEGDASLTIFGAPNRLPCPEDKALAAARAIADRLVNEMPECQAG
IGVAAGQVIAGNVGARERFEYTVIGEPVNEAARLCELAKSRPGKLLASAQAVDAASEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(5180. .5308)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="PS00041 Bacterial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     regulatory
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rv1319c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          araC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     family
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     E():
```

CDS

CDS

```
Qγ
                                                 밁
                                                                              Qγ
                                                                                                                 Ъ
                                                                                                                                                 Qy
                                                                                                                                                                                     В
                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                       DЪ
                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                          QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                         15713
                                                                                                                                                                                                                                                                                                                          15653
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15173
                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                   661
                                                                                                                                                                                                                       601
                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 aattegatgecagtecegeeggegecaceagegeegeegteacegateaaceeggeeggtg
                                                                                                                                                                                 acgctcaacccgccggtgccgccggcaccgccggcggccaacacctcgaacagcccgctg
ccattggagaacagcccgccccccccgccggtgccgccggtgccaccggttgcccccgttg
                                                                                                                                                                                                                                                                                                                                          9tgccgccgttccctccggccgagccggagactccgaacccgccggcggcgccgccaccg
                                                                                                                                                                                                                                                                                                                                                                                                            ccagttccgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ccggcgttgccgccgccgccggccgccctcaccgcccacgagttggttagcggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tcgggcgcgccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aacagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gccatttggtccgcactggaggcgccgaaccctccggtgcccccggcgcgccgcgggaccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ccgccgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGCCGGTGCCGCTACCGGCCGCCCCGGACGCTGTCGCCGCCGGTACCGCCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccgccggtgccgcctaccggccgcgccccggacgctgtcgccgccggtaccgccggcg
                                                                 ccggctccgaacagcccggccccgccgtcgccgtcgccgagcccgcctgtgccggtgttc
                                                                                                                                                                                                                                                         CCATTGGAGAACAGCCCGCCGCCCGCCGGTGCCGCCGGTGCCACCGGTGCCCCCGTTG
                                                                                                                                                                                                                                                                                                                         GTGCCGCCGTTCCCTCCGGCCGAGCCGGAGACTCCGAACCCGCCGGCGCCGCCGGCACCG
                                                                                                                                                                                                                                                                                                                                                                                            CCAGTTCCGCCGGTGCCGGCCGTTCGCCGGTGAAGATGCCGCCGTCGCCTCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCGGCGTTGCCGCCCGCCCGCCGGCCCCCCCCCCCCCACGAGTTGGTTACCGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TCGGGCCGCCGAGACCGGTTCCGCCGGTGCCGCCAATGCCGCCAGCGCCGAAGAGGATG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AACAGTGCGCCGGCACCGCCGATGCCGCCGACGCCTTTTGCCGCCGGTGCCGCCGGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCGCCGTCGCCGATCAGCTTGGCGGCCCCGCCGCTGCCACCGGACCCGCCGATGCCGCCG
                                                 CCGGCTCCGAACAGCCCGGCCGCCGCCGTCGCCGCCGAGCCCGCCTGTGCCCGGTGTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="hypothetical protein Rv1320c"
/protein_id="CAA98107.1"
/protein_id="CAA98107.1"
/db_xref="GI:1340086"
/db_xref="WISS-ROT:010633"
/translation="MPSEKATTRHLPGAVETLSPRTGRRPETPAYGSWLLGRVSESPR
MRRVRTQGMLTVAILVTNVIGLIVGAMLLTVAFPKPSVILDAPHWVSFGIVPGYCVLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GRHVGREVAAAAERERPKLGGEERHVAVVFVDIVGSTQLVTSRPAAEVVMLLNRFFTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RTMLVWLLCSGVPNVGVALTAIFDDTFWELSNDQFMITVLILWAPLLIFGFILMWILAWLTATPVRVVREALNRVEQGDLSGDLVVFDGTELGELQRGFNRMVEGLRERERVRDLF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FILGTYWLTROTARALRWAIEERTPSHDEARSAFLVPLRVALAVLFLWGAAAALWTII
YGLANRLFIPRFLFSMGVIGVVAATSCYLLTEFALRPMAAQALEVGATPRSLVRGIVG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 1156.2; DB Pred. No. 3.2e-66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         aı protein
7.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 32514;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0;
                840
                                                                                                                                                                                                                       660
                                                                                                                                                                                                                                                                                                                       15712
                                                                                                                                                                                                                                                                                                                                                         540
                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                 15892
                                                                                                                                                                                                                                                                                                                                                                                          15652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                15592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   15472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              15232
                                                 15952
                                                                                                                                                                                     15832
                                                                                                                                                                                                                                                       15772
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       15352
```

```
DEFINITION
ACCESSION
VERSION
                                           Qy
                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 2
MSGY151/c
LOCUS
. Q
                          망
                                                                   В
                                                                                                              В
                                                                                                                                QΥ
                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                                                             SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                οy
                                                                                                                                                                                                                                                                                                                               COMMENT
                                                                                                                                                                                                                                                                                                                   FEATURES
                                                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEYWORDS
                                                                                                                                                                                                                                                                                                                                                             AUTHORS
TITLE
                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 1095; Conserv
                                                                                                                                                                                                                                                       E COUNT
                                                                                                                                                                                                                                                                                                                                                    JOURNAL
                                                                      26622
                                                                                                               26682
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16193
                              26562
                                                                                                                                                         26742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              16013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     16073
                                                                                                                                                                                                                                                                                                           source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1021
                                                                                           157
        277
                                                  217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               961
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         901
                                                                                                                                   98
                                                                                                                                                                             38
                                                                   ccaccggacccgccgatgccgccggccatttggtccgcactggaggcgccgaaccctccg
                                                                                                              tytogccgccggta-ccgccggcgccgtcgccgtcagcttggcggcccgccgctg
                                                                                                                                                        cgtcaccgatcaacccgccggtgccgccggtgccgccgctaccggccgcgccccggacgc
                                      9tgccccggcgccgccgggaccgaacagtgcgccggcaccgccgatgccgccgacgcct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gcgcccgcagtaaaggtttga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  atgttgagcaggccctccaacggcgccgcggcggcggcctcagcgcttcgcgtacgcgcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cctttgccgccggtgccgcggggtcgggcgcgagaccggttccggcggtgccgcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCGCCCGCAGTAAAGGTTTGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATGTTGAGCAGGCCCTCCAACGGCGCCGCCGCGGCGGCCTCAGCGCTCGCGTACGCGCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GCCCCGCCGTTGCCGTACAGCAGCCCGCCGGCCCGCCCGGCTTGCCCGGTCCCCGGTGCG
                                                                                                                                                                                                                                                                                                                              Direct Submission
Submitted (11-OCT-1996) L.Du,
Beaver Street, Waltham, MA, US
GSDB:S:1004706
                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium tuberculosis (clone: y151) ds-DNA.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacterida
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
Mycobacterium; Mycobacterium tuberculosis complex.
1 (bases 1 to 37036)
                                                                                                                                                                                                                                                                                                                                                                                                                                                           MSGY151 37036 bp DN/
Mycobacterium tuberculosis
AD000018
AD000018.1 GI:1717734
                                                                                                                                                                                                                                                                                                                                                                         Du, L
                                                                                                                                                                                                                                                                 6476
                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                 b
                                                                                                                                                                                                                                                              /organism="Mycobacterium
/db_xref="taxon:1773"
/clone="y151"
12410 c 11973 g 6177
                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                           90.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               16333
                                                                                                                                                                                                 Score 1045; D
Pred. No. 2.8e
0; Mismatches
                                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sequence
                                                                                                                                                                                                                                                                                                                                        usa, 02154
                                                                                                                                                                                                 DB 2;
2.8e-59;
les 25;
                                                                                                                                                                                                                                                                                                tuberculosis
                                                                                                                                                                                                                                                                                                                                       Therapeutics Corporation, 54 du@cric.com
                                                                                                                                                                                                                                                                                                                                                                                                                 Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 clone
                                                                                                                                                                                                                     Length 37036;
                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 у151.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10-DEC-1996
                                                                                                                                                                                                  5
                                                                                                                                                                                                 Gaps
                                                276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1140
                                                                                                                                                        26683
                                                                                                                                                                             97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1080
                           26503
                                                                      26563
                                                                                          216
                                                                                                               26623
                                                                                                                                   156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        16312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  16252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           16192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    16132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              16072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   900
                                                                                                                                                                                                 ω
••
```

```
RESULT
MTCY1A11
LOCUS
                                                   VERSION
KEYWORDS
SOURCE
                                                                                  DEFINITION ACCESSION
                                                                                                                                                           밁
                                                                                                                                                                               Š
                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                      DЬ
                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                          ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26382
                                                                                                                                                           25666
                                                                                                                                                                                                   25726
                                                                                                                                                                                                                                                                                    25846
                                                                                                                                                                                                                                                                                                                              25906
                                                                                                                                                                                                                                                                                                                                                                      25966
                                                                                                                                                                                                                                                                                                                                                                                                                26026
                                                                                                                                                                                                                                                                                                                                                                                                                                                         26086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  26262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            26322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      26502
                                                                                                                                                                               1117
                                                                                                                                                                                                                                                                997
                                                                                                                                                                                                                                                                                                         937
                                                                                                                                                                                                                                                                                                                                                  877
                                                                                                                                                                                                                                                                                                                                                                                           817
                                                                                                                                                                                                                                                                                                                                                                                                                                   757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                337
                                                                                                                                                                     gcctcagcgctcgcgtacgcgccagcgcccgcagtaaaggtttga
                                                                                                                                                                                                                                                                                   tggccgggcgcccggacccgccggccccgccgttgccgtacagcagcccgccggccccg
                                                                                                                                                                                                                                                                                                                            aacagcagcccgccggcccgcccgccagccgcgcgcgttgcccgggccgttacccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ccggtgccaccggtgcccccgttgacgctcaacccgcggtgccgccggcaccgccggcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aaccegccggcgccgccggcaccgccattggagaacagccgccgccgccgccgccggtgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        aacagctgggtgggcgtgttcacaatgttgagcaggccctccaaccggcgccgcggcggcg
                                                                                                                                                                                                                                                      ccggcttgcccggtccccggtgcgccgttggcgcgttgccgatcagcggacgcccagc
                                                                                                                                                                                                                                                                                                                                                                                                                          ggcccgccggccgatgccaccggctccgaacagcccggccgccccgccgtcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gccaacacctcgaacagcccgctgcgaccgccggccgccgccggcgccaccgttgaagcct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccgcccacgagttggttagccggtgccagttccgccggtgccgccggtcccgccgttgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCTTTGCCGCCGGTGCCGCCGGGGTCGGGCGCCGAGACCGGTTCCGCCGGTGCCGCCA
                                                                                                                                                           GCCTCAGCGCTCGCGTACGCGCCCAGCGCCCGCAGTAAAGGTTTGA
                                                                                                                                                                                                   AACAGCTGGGTGGGCGTGTTCACAATGTTGAGCAGGCCCTCCAACGGCGCCGCCGCGGCGCG
                                                                                                                                                                                                                                             CCGGCTTGCCCGGTCCCCAGGTCGCCGTTGGCGCTTGCCGATCAGCGGACGCCCCAGC
                                                                                                                                                                                                                                                                                                                                                                                                                CCGAGCCCGCCTGTGCCGGTGTTCCCGACTCCGCCGGGCCCCACGGCGCCGCCGGAGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCCAACACCTCGAACAGCCCGCTGCGAACGCCGGCCGCCGGCGCGCCCAACGTT--AACCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MTCY1All 308
Mycobacterium 1
Z78020 AL123456
Z78020.1 GI:33
                             Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria;
Mycobacterium.

1 (bases 1 to
                    Actinomycetales; Corynebacterineae;
                                                                             DN.
Lerium tuberculosis
AL123456
                                                                                                      30850
                                                                                                      ďď
                                                                                              H37Rv
                                                                                             complete
                     Mycobacteriaceae;
                               Actinobacteridae;
                                                                                             genome;
                                                                                                                                                            25622
                                                                                                       17-JUN-1998
                                                                                              83/162.
                                                                                                                                                                                                                        1116
                                                                                                                                                                                                                                                                1056
                                                                                                                                                                                                                                                                                                                                                                                                                                                      26027
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            636
                                                                                                                                                                                                                                                                                    25787
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  26203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           26383
                                                                                                                                                                                                   25667
                                                                                                                                                                                                                                                                                                         996
                                                                                                                                                                                                                                                                                                                              25847
                                                                                                                                                                                                                                                                                                                                                  936
                                                                                                                                                                                                                                                                                                                                                                      25907
                                                                                                                                                                                                                                                                                                                                                                                           876
                                                                                                                                                                                                                                                                                                                                                                                                                                   816
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      696
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        26145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26323
                                                                                                                                                                                                                                             25727
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26443
                                                                                                                                                                                                                                                                                                                                                                                                                25967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            26263
```

gene

CDS

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
                                                                                                                                                                                                        gene
                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Parkhill, J.

Direct Submission
Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk
On Jun 27, 1998 this sequence version replaced gi:1483528.

Notes:
Details of M. tuberculosis sequencing at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Nature 3
98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and Barrell, B.G. Deciphering the bloogy of Mycobacterium tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Erratum:[[published erratum appears 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complete genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (bases 1 to 30850)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="Rv1814"
/note="Rv1814, (MTCY1A11.29c), unknown, len: 300, weak similarity to eg ERG3_YEAST P32353 c-5 sterol desaturas similarity to eg ERG3_YEAST P32353 c-5 sterol desaturas (365 aa), FASTA scores, opt: 154, z-score: 191.4, E()
                                                                                                                                         /gene="Rv1815"
1176. .1841
                                                                                                                                                                                                                                                                                                                                       /product-"hypothetical protein Rv1814"
/protein_id="CAB81464.1"
/db_xref="G1:1483557"
/db_xref="SWISS-PROT:050619"
/db_xref="MRDPVLFA1PCFLLLLILEWTAARKLESIETAATGQPRPASGAY
/Translation="MRDPVLFA1PCFLLLLILEWTAARKLESIETAATGQPRPASGAY
LTRISSYASISMGLVSIATTAGWKSLALLGYAAIYAYLAPWOLSAHRWYTWVTAIVGVD
LLYYSYHRIAHRVRLIWATHQAHHSSEYFNFATALRQKWNNSGEILMWVPLPLMGLPP
/note="Rv1815, (MTCY1A11.28c), unknown, len:
to hypothetical protein G473456 M. fortuitum
FASTA scores, opt: 182, z-score: 218.6, E():
                                                                                                                                                                                                                                               FGPPGWEPRTIDKSNAAASLVTSR"
                                                                                                                                                                                                                                                                               IIWDRLFGSFQPELFRPHYGLTKRVDTFNIWKLQTREYVAIVRDWRSATRLRDRLGYV
                                                                                                                                                                                                                                                                                                                  WMVFCSWSLNLIYQFWVHTERIDRLPRWFEFVFNTPSHHRVHHGMDPVYLDKNYGGIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Mycobacterium tuberculosis"
/strain="H37Rv"
                                                                                                         /gene="Rv1815"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref="taxon:1773"
/clone="Y1A11"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .30850
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rv1814"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             in Nature 1998 Nov
       221, simil (255 aa), 3.2e-05,
                                                                  similar
```

gene

CDS

```
/note="ggtgatc,
1904. .2608
/gene="Rv1816"
1904. .2608
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="hypothetical protein Rv1816"
/protein_id="CaB01463.1"
/protein_id="CaB01463.1"
/db_xref="G1:148355"
/db_xref="SWISS-PROT:Q50617"
/translation="MCOTCRVGKREDARSQIEAKIVELGRRQLLDHGAAGLSLRAIAR
NLGMVSSAVYRYVSSRDELLTLLLVDAYSDLADTVDRARDDTVADSWSDDVIAIARAV
RGWAVTNDARWALLYGSSVPGYHAPPDRTAGVATRVVGAFFDAIAAGIATGDTRUTDD
VAPQPMSSDFEKIRQEEGFFGDDRVVTKCFLLMAGVVGAISLEVFGQYGADMLTDPGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation="MSTDIPATVSAETVTSWSDDVDVTVIGFGIAGGCAAVSAAAAGA
RVLVLERAAAAGGTTALAGGHEYLGGGTTVQLATGHDSSEEMKXYLVAVSREPDHDK
RRYCDGSVEHENWLEGLGFQDERSYFPGKAVJQPNTBGLMAFTQNEKVMPFLELLAVPS
PRGHKVPVPGDTGGAAMVIDLLLKRAASLGIQIRYETGATELIVDGTGKVTGVMMKRF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Rv1817, (MTCY1A11.26c), flavoprotein similar to G746486 flavoprotein subunit of fumarate reductase fad domain homologue (474 aa), FASTA scores, opt: 223, z-score: 250.0, E(): 5.7e-07, (24.1% identity in 489 aa
/translation="msfvvtipealaavatdlagigstigtanaaaavptttvlaaa
DEVSAAMAALFSGHAQAYQALSAQAALFHEQFVRALTAGAGSYAAAEAASAAPLEGVL
DVINAPALALLGRPLIGNGANGAPGTGANGGDGGILIGNGGAGGSGAAGMPGGNGGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(4826. .6322)
/gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(4826. .6322)
/gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SETGAIKAKSVIIAAGGFYMNPDMVAKYTPKLAEKPFVLGNTYDDGLGIRLGVSAGGA
TQHMDQMFITAPPYPPSILLTGIIVNKLGQRFVAEDSYHSRTAGFIMEQPDSAAYLIV
DEAHLEHPKMPLVPLIDGWETVVEMEAALGIPPGNLAATLDRYNAYAARGADPDFHKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="hypothetical
/protein_id="CAB01462.;
/db_xref="GI:1483554"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="Rv1817"
3243. .4706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Rv1816, (MTCY1A11.27c), len: 234, unknown, involved in regulation, contains helix-turn-helix aa 38-59, (+4.30 SD)."
                                                                                                                                        /product="PE_PGRS"
/protein_id="CAB01461.1"
/db_xref="GI:1483553"
/db_xref="SWISS-PROT:Q50615"
                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="Rv1818c, (MTCY1A11.25), len: 498, ; Members family, glycine rich PGRS-subfamily, contains PS00583 pfkB family of carbohydrate kinases signates from the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the contains of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PEFLAAQDNGPWGAFDMSLGKAMYAGFTLGGLATSVDGQVLRDDGAVVAGLYAVGACA
SNIAQDGKGYASGTQLGEGSFFGRRAGAHAAARAQGM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="Rv1817"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3243. .4706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VFDAQTRLLVAVLAEH"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1904. .2608
/gene="Rv1816"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EATVLADDVTASNILPSGRALESRPGVVLHPGQAVCHFGVSTGETCGTVESVNNGWFT MSHGVLSEKGDSGGPVYLAPDGGPAQIVGIFNSVWGGFPAAVSWRSTSEQVHADLGVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTLGYVDPALKIAFTAGHCRGGGAVTSRDYKVIGHLRAIRDNTPSGSTVATHELIADY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="hypothetical protein Rv1815"
/protein_id="CAB01480.1"
/db_xref="GI:3361626"
/translation="MYRLVPRAFAATVALLAAGFSPATASADPVLVFPGMEIRQDNHV
                                                                                                                                                                                                                                                                                                                                             /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="SPTREMBL:Q50616"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (29.6% identity in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                possible rbs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   al protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ı protein Rv1815"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ı protein Rv1817"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; Member
                                                                                                                                                                                                                                                                                                                                                                                                                                             signature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 possibly motif at
```

CDS

```
Best Loc
Matches
                                                        5200
                                                                                                                                                                                                                                                                5080
                                                                                                                                                                                                                                                                                                                                                                   5020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4900
                                                                                                                                                             5140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      misc_teature
                                                                                                                                                                                                                                                                                                                185
                                                                                                                                                                                                                                                                                                                                                                                                                   128
                                                                                                                                                                                                             239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              æ
                                                     CCAGCAGGCCGGCGTTGCCGCCCGCCCGCCGGCACCGGCTAGTGGACCCGACCCCAC
                                                                                                                                                                                        tttggtccgcactggaggcgccgaac----cctccggtgccccccggcgccgccgggac
                                                                                                                                                                                                                                                                                                                                                                                              cgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgcc---ggcca 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tgccgccgctaccggccgcgccccggacgctgtcgccgccggtaccgccgccgccgt 127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tgccagtcccgccggcgccaccagcgccgtcaccgatcaacccgccggtgccgccgg
ATCCGCCGGCGCCGCACCAAACAGCAGGCCCGCAGTGCCGCCGTTTCCGCCGGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGCCGCCGTCACCGCCCTTGGCACCGGTGCCGTTTCCTCCGGCGCCGCCGTCACCGCCGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TGCCACTCCCGGCGTTGCCGCCGTTGCCGACCAGGATGGCACCGCCGCCAG
                                                                                                                                                                                                                                                                                                                                                                   CGCCGATCAGCCCGGCTTTGCCGCCGAGCCCACCGGCGCCCCCGGCACCGCCGAAGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                        tgccgccggggtcgggcgcgagaccggttccggcggtgccgccaatgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="hypothetical protein Rv1819c"
/protein_id="CAB01460.1"
/protein_id="CAB01460.1"
/protein_id="GB11483552"
/db_xref="GI:1483552"
/db_xref="GI:1483552"
/db_xref="GI:1483552"
/db_xref="GI:1483552"
/translation="MGPKLFKPSIDWSRAFPDSVYWVGKAWTISAICVLAILVLLRYL
/translation="MGPKLFKPSIDWSRAFPDSVYWVGKAWTISAICVLAILVLLRYL
/TPWGRQFWRITRAYFVGPNSVRVWLMLGVLLLSVVLAVRLNUTTGSYCONDMYTALQKA
FEGIASDGTVKRSGVRGFWMSIGVFSVMAVLHVTRVMADIVLTQRFIIAWTTHH
LTQDWLDGRAYYRDLFTDETIDNPDQRIQDWDIFTAGAGGTPNAPSWTASTILEG
VQSIISVISFTAILWNLSGTLNIFGVSIPRAMFWTVLVYVFVATVISFIIGRPLIWLS
FRNEKLNAAFFRALVRLRDAARBAVGFYRGERVEGTQLQRRFTYDTDAYRRRYNRSIAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="Rv1819c, (MTCY1A11.24), abc transporter, len: 639 similar to eg G925031 multidrug resistance protein (592 aa), FASTA scores, opt: 1235, z-score: 1407.4, E(): 0, (40.6% identity in 623 aa overlap): contains PS00017 ATP/GTP-binding site motif A, PS00211 ABC transporters family signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(6682. .6726)
/gene="Rv1819c"
/note="PS00211 ABC transporters family signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NGWNLSVSQTIVPLPWVIQAPRLFAGQIDFGDVGQTATSFGNIHDSLSFFRNNYDAFA
SFRAAIIRLHGLVDANEKGRALPAVLTRPSDDESVELMDIEVEPPAGDRLIDPLDVRL
DRGGSLVITGRSGAGKTTLLRSLAELMPYASGTLHRPGGENETMFLSQLPYVPLGTLR
DVVCYPNSAAIPDATLRDTLTKYALAPLCDRUDEERDWAKVLSPGEQQRVAFARILL
TKPKAVFLDESTSALDTGLEFALYQLLRSELPDCIVISVSHRPALERLHENQLEILGG
GQWRLAPVEAAPAEV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(6457. .8376)
/gene="Rv1819c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="PS00583 pfkB family of signature 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(4934. .5008)
/gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GGNGGLLFGAGGVGGVGGDGVAFLGTAPGGPGGAGGAGGLFGVGGAGGAGGIGLVGNG
GAGGSGGSALLWGDGGAGGAGGVGSTTGGAGAGAGAGLLGGAGAGAGAGAGAGAGAGAG
VGGAAGGNGGTAGLLFGAGGAGGFGFGGAGGAGGAGGLGGKAGLIGDGGDGGAAGAGNGTGAKG
GDGGAGGGAILVGNGGNAGSGTPNGSAGTGGAGGLLGKNGLNGNGLP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement(6457. .8376)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         signature 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement (5462.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="Rv1819c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="PS00583 pfkB family
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    35.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 413.4; DB 2;
Pred. No. 1.5e-19;
0; Mismatches 396;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   carbohydrate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      carbohydrate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         kinases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                           5199
                                                                                                                                                                                                                                                                                                                                                                5079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5019
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4959
                                                                                                                                                                                                                                                             5139
                                                                                                                                                                                                                                                                                                                238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            67
                                                                                                        343
                                                                                                                                                                                                             289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6,
```

P Qy

γο γο γο QΥ

В

δÃ

P 64 B

В

```
KEYWORDS
SOURCE
                                                                                                                                                                                        RESULT
MTV002/c
                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                           Вр
                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ър
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                  REFERENCE
                                                                                                                                                      DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                         VERSION
                                                                                                                                                                               LOCUS
                                                                                                     ORGANISM
                                       AUTHORS
                                                                                                                                                                                                                                           6040
                                                                                                                                                                                                                                                                                                                                             5920
                                                                                                                                                                                                                                                                                                                                                                                             5860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5260
                                                                                                                                                                                                                                                                                                                                                                                                                                              5800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5320
                                                                                                                                                                                                                                                                                                                    1049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5440
                                                                                                                                                                                                                                                                                                                                                                      989
                                                                                                                                                                                                                                                                                                                                                                                                                     929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             404
                                                                                                                                                                                                                                         cggcggcggcctcagcgctcgcgtacgcgccagcgcccgcagtaa 1153
                                                                                                                                                                                                                                                                                                          gccccagcaacagctgggtggtgttcacaatgttgagcaggccctccaacggcgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCGCGCCGCCGCCGTCGCCCAGAGCAGGGCGGACCCGCCGGACCCCCCGCCAC
                                                                                                                                                                                                                                                                                                                                           CGTCGCCGTTTGCCCCGGTCCCCGGGGCCCCGTTGGCTCCGTTACCGATCAGTGGGC
                                                                                                                                                                                                                                                                                                                                                         cggccccgccggcttgcccggtccccggtgcgccgttggcgccgttgccgatcagcggac
                                                                                                                                                                                                                                                                                                                                                                                                          cgccggcctggccgggcgcccggacccgccggccgttgccgtacagccgccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgtcaccccggccccacccggccgttgccgaatagccccgcgggctccacctgggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGCCGTAGAGCAGCCCGCCGGCCCGGCCCGGCCGAACCCTGCGGTGCCGGACGCTA 5799
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cctcgaacagcccgctgcgaccggccggcccggcgccaccgttgaagcctggcccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CGCCGGCACCGCCGGTGACATTAGTGCCGGTGCCGCCGGCCCGCCGGCACCGCCACGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tgccgccgtcgcctccggtgccgccgttccctccggccgagccggagactccgaacccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCCCCAACAGCGCCCAGGGGGGGGGGGTTGATCACGTCGAGCACACCCTCTAGCGGGGCCG
                                                                                                                                                                                                                                                                                                                                                                                             CCCCGGGCATGCCGGCCGCCGGAGCCGCCGGCCCGCCGTTGCCGATCAAGATTCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                              CGTTCCCCCCGGCGCCGCCGGCCCGTTGCCGAACAGGCCAGCGGCTCCGCCGTTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGAAGAACAACCCGCCGTCTCCGCCGGCCGCCGTCACCGGCGTCAGCCGCGAGTCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGCCGTTCCCGACCAATCCGATTCCGCCGGCCGCCGGCCCCACCGACGCCGAACAGCC
           Harris,D.,
Tekaia,F.,
                                                                         Mycobacterium tuberculosis.
Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Bacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                       Mycobacterium tuberculosis
AL008967 AL123456
AL008967.1 GI:3261491
                                    Cole, S.T.,
                                                Mycobacterium; Mycobacterium 1 (bases 1 to 56414)
                                                                                                                                                                            MTV002
Brosch,R., Parkhill,J., Garnier,T., Churcher,C., Gordon,S.V., Elglmeler,K., Gas,S., Barry III,C.E., Badcock,K., Basham,D., Brown,D., Chillingworth,T., Davies,R., Devlin,K., Feltwell,T., Gentles,S.,
                                                                                                                                                                            56414 bp
                                                                                                                                                                             DNA
                                                                                                                                                                H37Rv complete
                                                                tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -ccggccgccccgccgt
                                                                complex
                                                                                                                                                                genome;
                                                                                                                                                                segment 122/162
                                                                                                                                                                             17-JUN-1998
                                                                                                                                                                                                                                                                                                                                             5979
                                                                                                                                                                                                                                                                                                                                                                    1048
                                                                                                                                                                                                                                                                                                                                                                                             5919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5739
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5679
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5439
                                                                                                                                                                                                                                                                                                                                                                                                                     988
                                                                                                                                                                                                                                                                                                                                                                                                                                              5859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         703
```

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOURNAL
                                    CDS
                                                                                               gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Nature 39
98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           implemented in Tbparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill(sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2624256.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hamlin,N., Holroyd,S., Hornsby,T., Jagels,K., Krogh,A., McLean,J., Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A., Rajandream,M.A., Rogers,J., Rutter,S., Seeger,K., Skelton,S., Squres,S., Squres,R., Sulston,J.E., Taylor,K., Whitehead,S. and Barrell,B.G.
Deciphering the biology of Mycobacterium tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Parkhill, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Erratum:[[published erratum appears in Nature 1998 Nov 12;396(6707):190]] 2 (bases 1 to 56414)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complete genome sequence
Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="recX"
complement(3. .527)
/gene="recX"
complement(493.
/gene="recA"
                                                                                                                                                                                 /db_xref="sptrembl:033280"
/translation="mtvSCpppSTSEREEQARALCLRLLTARSRTRAELAGQLAKRGY
pedignrvLdrlaavgLvddtdfaeQmvQSrranaakSKRalaaeLhakGvdddyItt
                                                                                                                                                                                                                                                                                                                                                                                                                                              overlap. Overlaps and extends CDS from ovelapping cosmid MTCY154.16c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note-"Rv2736c, (MTV002.01c), len: 174 aa. recX, similar to eg. RECX_PSEAE P37860 regulatory protein recx from Pseudomonas aeruginosa (153 aa), fasta scores; opt: 161 z-score: 257.2 E(): 3.6e-07, 30.7% identity in 137 aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="fragment designated v002. Does not represent physical clone"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        <u>^</u>
                                                                                               complement(493.
                                                                                                                                VIAELAAERERRRV"
                                                                                                                                                                                                                                                                                    /product="recx"
/protein_id="CAA15532.1"
/db_xref="GI:2624257"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(3. .527)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1. .56414
                                                                                                                                                             VLGGIDAGAERGRAEKLVRARLRREVLIDDGTDEARVSRRLVAMLARRGYGQTLACEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="taxon:1773"
/clone="Y154"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Mycobacterium
/strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /strain="H37Rv"
/db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /organism="Mycobacterium
                                                                 /gene="recA"
                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tuberculosis"
```

```
/note="Rv2738c, (MTV002.03c), len: 68 aa. Unknown, N-terminus is highly similar to the N-terminus of the upstream ORFMTV002.07c (78.4% identity in 37 aa overlap); also similarto An020958 [SC418_5 Streptomyces coelicolor cosmid 4H8 (64aa) opt: 185 z-score: 283.5 E(): 2.9e-08; 39.7% identityin 63 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Rv2737c, (MTV002.02c), len: 790 aa. recA, identicalto RECA,MYCTU P26345 reca protein (790 aa). Contains self-splicing protein element (intein) from 2294 to 969 (c), similar to intein If from TR:E332317 (EMBL:Y13030) DNA-directedDNA polymerase (EC 2.7.7.7) from Thermococcus sp. (1829 aa), fasta scores; opt: 81 z-score: 235.2 E(): 66-06, 24.6%identity in 183 aa overlap. Contains PS00017 ATP/GTP-bindingsite motif A (P-loop), PS00321 recA signature, and PS00881Protein splicing signature. See Davis et al, (1992) Cell71(2):201-210"
                               /note="Rv2739c, (MTV002.04c), len: 388 aa. Probable transferase, similar to eg. TR:Q51560 (EMBL:L28170) Pseudomonas aeruginosa rhamnosyl transferase (426 aa), Fasta scores; opt: 178 z-score: 226.3 E(): 1.9e-05, 25.98 identity in 425 aaoverlap. Equivalent to Mycobacterium leprae protein MLCB33.02c (392 aa); fasta scores
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(2873. .2877)
/note="possible RBS upstream of Rv2737c"
complement(3247. .3453)
/gene="Rv2738c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGELRKGDRVAQPRREDGFGDSAPIPADHARLLGYLIGDGRDGWVGGKTPINFINVQR
ALIDDVTRIAATLGCAAHPQGRISLAIAHRPGERNGVADLCQQAGIYGKLAWEKTIPN
WFFEPDIAADIVGNLLFGLFESDGWVSREQTGALRVGYTTTSEQLAHQIHWLLLRFGV
GSTVRDYDPTQKRPSIVNGRRIQSKRQVFEVRISGMDNVTAFABSVPMGPRGAALIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /protein_id="CAA15533.1"
/db_xref="G1:2624258"
/db_xref="SWISS-PROT:P26345"
/ta_nslation="MTQTPDREKALELAVAQIEKSYGKGSVMRLGDEAKQPISVIPTG
/translation="MTQTPDREKALELAVAQIEKSYGKGSVMRLGDEAKQPISVIPTG
SIALDVALGIGGLPRGRVIEIYGPESSGKTTVALHAVANAQAAGGVAAFIDAEHALDP
gp|Z94723|MLCB33_2 Mycobacteriumleprae cosmid B33 opt:
                                                                                                                                                                                                                                                                complement(3464. .4630)
/gene="Rv2739c"
                                                                                                                                                                                                                                                                                                                                           complement(3464 . .4630)
/gene="Rv2739c"
                                                                                                                                                                                                                                                                                                                                                                                                                          EDGVEPRDVWRALCADFDVPHDRW"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="hypothetical protein Rv2738c"
/protein_id="CAA15534.1"
/db_xref="GI:2624260"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(3247. .3453)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(2644. .2667)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(2197. .2223)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="PS00881 Protein splicing signature"
complement(790. .2112)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QGKENARNFLVENADVADEIEKKIKEKLGIGAVVTDDPSNDGVLPAPVDF" complement(790. .807)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VAEGVVVHNCSPPFKQAEFDILYGKGISREGSLIDMGVDQGLIRKSGAWFTYEGEQLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DYAKKLGVDTDSLLVSQPDTGEQALEIADMLIRSGALDIVVIDSVAALVPRAELEGEM
GDSHYGLQARLMSQALRKMTGALNNSGTTAIFINGLKDKIGVRGSPETTTGGKALKF
YASVRMDVRRYETLKDGTNAYGNTRYKVKVKNKCLABGTRIEDPVTGTTHRIEDVDG
RKPIHVVAAAKDGTLHARPVVSWEDQGTRDVIGLRIAGGAIVWATPDHKVLTEYGWRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
/product="recA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="SPTREMBL:033281"
/translation="MLAGVRLTEFHERVALHFGAAYGSSVLLDHVLTGFDGRSAAQAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="PS00017 ATP/GTP-binding site motif A (P-loop)"
complement(2873. .2877)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="PS00321 recA signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LGASRLRRDRVQALADALDDKFLHDMLAEELRYSVIREVLPTRRARTFDLEVEELHTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    aipeatqgrrrgsqatylaaemtdavlnyldergytaqeaaamigvasgdprggmkqv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="recA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="recÀ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="recA intein"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="recA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="Rv2738c"
```

misc_feature

misc_feature

misc_feature

misc_feature

gene

RBS

CDS

cps

CDS

```
Query Match
Best Local S
Matches 751
                                         6404
                                                                                                                                                                                       6524
                                                                                                                                                                                                                                                              6584
                                                                                                                                                                                                                                                                                                                                    6644
                                                                                                                                                                                                                                                                                                                                                                                                          6704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6764
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                168
                                                                                                                                                                                                                                                                                                                                                                      123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ma.
Local 51.
751;
                                                                                                                                                   288
                                                                                                                                                                                                                          228
                                                                                                                                                                                                                                                                                                                                                                                                                                              63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ttggttagcggtgccagttccgccggtgccggtcccgccgttgccggtgaagatgcc
                                                          TAGCAGGCCGCCATTACCGCCGTGACCACCGTGGCCAGCGACAGTGGCGACTCCGCCTGC
                                                                                                                                    ggtgccgcgggggtcgggcgccgagaccggttccggcggtgccgccaatgccgccagc
                                                                                                                                                                                                          gccgatgccgccggccatttggtccgcattggaggcgcaaccctccggtgcccccggc
                                                                                                                                                                                                                                                                                                                                                         gccggtgccgccgctaccggccgcgccccggacgctgtcgccgccggtaccgccggcgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ttcgatgccagtcccgccggcgccaccagcgccgtcaccgatcaacccgccggtgcc
                                                                                                                                                                                      GCCGCCGTCGCCGAACCCGCCGAACCCGCCGCCGCCTCCGCCGCCCCACCGGTGCCGTA
                                                                                                                                                                                                                                                              GCCGGAACCGTAGAACGTGCCGGCGTTACCGCCGGCCGCCGCCGCCACCACCTTAGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MARLTETSPETPEAIRAVEAFLNALQNEDFDTVDAALGDDL
VYENVGESRIRGGRRTATLLRMQGRVGFEVKIHRIGADGAAVLTERTDALIIGPLRV
QFWVCGVFEVDDGRITLMRDYFDVYDMFKGLLRGLVALVVPSLKATL"
5355. 6932
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4674.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAGIDAVELDGLAATDRDLDAGARIHRRAAQMAVLNVPRLRALEPELVVSDVITACGG
MAAELLGIPWVELNPHPLYLESKGLPPIGSGLAAGTGIRGRLRDATMRALTGRSWRAG
LRQRAAVRVEIGLPARDPGPLRRLEVATLAGTROWNYVGPLHFEPTDRYLA
IPAGTGPVVVVAPSTALTGTAGLTEVALQSLTPGETVPSGSRLVVSRLSGADLTVPPW
AVAGLGSQAELLTRADLVICGGGHGMVAKTLLAGVPMVVVPGGGDQWEIANRVVRQGS
AVLIRPLTADALVAAVNEVLSSPRFREAARRAAASVAGAADPVRVCHDALALAG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv2740, (MTV002.05), len: 149 aa. unknown, similar to M. leprae hypothetical protein TR:Q49850 (EMBI:Z94723) MLCB33.03 (B235_F3_140) (178 aa), fasta scores; opt: 498 z-score: 538.9 E(): 7.3e-23, 51.6% identity in 161 aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv2740"
4674. .5123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product-"hypothetical protein Rv2739c"
/protein_id-"CAA15535.1"
/protein_id-"CAA15535.1"
/db_xref-"G1:2624261"
/db_xref-"SPTREMBL:033282"
/translation-"MRVAVVAGPDPGHSFPAIALCQRFRAAADTFTLFTGVEWLEAAR
/translation-"MRVAVVAGPDPGHSFPAIALCQRFRAAADTFTLFTGVEWLEAAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Rv2741, (MTV002.06), len:
tuberculosis PE_ PGRS subfamily,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="PE_PGRS"
5355. .6932
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="hypothetical protein
/protein_id="CAA15536.1"
/db_xref="GI:2624262"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="Rv2740"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     35.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 413.2; DB 2; Pred. No. 1e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2364.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E():
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      398;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          80.9%identity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              525 aa;
similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Member of M. to many eq.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          56414;
                                                                                                                                                                                                                                                                                                                                                                      ----c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                      6465
                                                                                                                                                                                                                                                                                                                                    6585
                                                                                                                                                                                                                                                                                                                                                                                                          6645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6705
     467
                                                                           407
                                                                                                               6405
                                                                                                                                                                                                                                                              6525
                                                                                                                                                                                                                        287
                                                                                                                                                                                                                                                                                                227
                                                                                                                                                                                                                                                                                                                                                                        167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
```

```
RESULT
MTV043/c
                                                                              Qy
                                                                                                            В
                                                                                                                                   Ωy
                                                                                                                                                               В
                                                                                                                                                                                       Qy
                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                          DЪ
                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                               DЪ
                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                     Вb
                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                        рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ДЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                         5633
                                                                                                                                                                                                                                                                             5873
                                                                                                                                                                                                                                                                                                                                                                                      5993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6287
                                                                                 1113
                                                                                                                                                                                                                                                                                                                                5933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6344
                                                                                                                                                                                          993
                                                                                                                                                                                                                                                  939
                                                                                                                                                                                                                                                                                                     879
                                                                                                                                                                                                                                                                                                                                                           822
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCCGGCAGCACTGCCGAAGCCACCGTGCCCGCCGGCCGACGCC---AAACAGCCC
                                                         GGCGGCTTCAGCGGAGGCATACGAGTACGCGCCCGCGGTCAAGGCCTG
                                                                     ggcggcctcagcgttacgcgccagcagcgccagtaaaggtttg
                                                                                                                                cagcaacagctgggtggtgttcacaatgttgagcaggccctccaacggcgcgcgggc
                                                                                                                                                                             cccgccggcttgcccggtccccggtgcgccgttggcgcgttgccgatcagcggacgccc
                                                                                                                                                                                                                                     GGCACCGCCGGCCCGCCGTTGCCAAACAATCCGGCAGCTCCTCCGTTACCGCCCTTCTG
                                                                                                                                                                                                                                                                                           ggcccacccgccgccgttgccgaatagcccgcggctccacctgggcctggcctg
                                                                                                                                                                                                                                                                                                                                CAGCCCACCGGCGCCGTTTCCGCCGGCGCGCCGTTGCCGGCTTGGTTGGACGCGCC
                                                                                                                                                                                                                                                                                                                                                      cagcccgccggcccgccggcccgccagccgccgttgcccg---ggccgtcaccccc
                                                                                                                                                                                                                                                                                                                                                                                                  tgtgcc----ggtgttcccgactccgccgggccccccgggcgccgccggaccag
                                                                                                                                                                                                                                                                                                                                                                                                                                                        gaacagcccgctgcgaccgccggcccgccggcggcaccgttgaagcctggcccgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccgtcgcctccggtgccgcttccctccggccgagccggagactccgaacccgccggc
                                                                                                            GAGCGCGCTTCTGAAGGGCGCATTTATCACATCGACTAGTTGCTGAAGCGGTGTCACGGC
                                                                                                                                                                 CCCGCCGTCTTGTCCGGTCCCCGGTTTACCGTTGGCGCCGTTGCCGATCAGGGGGGCGGCC
                                                                                                                                                                                                                       GCCGGAGCCGGCCAGCCCTGATCCCCCGTTACCGCCGCTGCCGTACAAGAGTCCGCCGGC
                                                                                                                                                                                                                                                                                                                                                                                      AGCGGCATCAAGAAAGGTGGTGAACCCGCCGTTGCCACCGGTCCCCGGGTGCCCCAGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                          GCCCGCACCGCCGTTGCCACCGGCGGCCTGGGCCGCCGCCGAGGGCGGCGGCCGCCTAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGTGTCGCTGAAGCCGCCGGCGGCGCCGGCACCGGCGCGCGAACAGCCCACCGACCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCCGCTGCCGCCGTCGCCGGTCCCCACCGGTGTCGCCGAAGCCACCGACGCCGCCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -GAACAGCCCGCCGGCCCGCCAGCCCCGCCGGTCCCACC
                                                                                                                                                                                          1052
                                                                                                                                                                                                                       5754
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6174
                                                                                                            5634
                                                                                                                                                                 5694
                                                                                                                                                                                                                                                  992
                                                                                                                                                                                                                                                                            5814
                                                                                                                                                                                                                                                                                                                                5874
                                                                                                                                                                                                                                                                                                                                                           878
                                                                                                                                                                                                                                                                                                                                                                                      5934
                                                                                                                                                                                                                                                                                                                                                                                                                821
                                                                                                                                                                                                                                                                                                                                                                                                                                          5994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   587
                                                                                                                                                                                                                                                                                                       938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   767
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                647
```

REFERENCE AUTHORS (bases 1 to 68848)

Вþ QΥ Дb Ş ДЪ QΥ В ρy

ζ,

δÃ

В

B Qy

Вþ

Locus

H37Rv complete

genome;

24-JUN-1999 segment 40/162.

DEFINITION ACCESSION VERSION SOURCE ORGANISM KEYWORDS Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry II., C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLear Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Mandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Rutter, S., Seger, K., Skelton, S., Rutter, S., Seger, R., Skelton, S., Rutter, S., Rutter, S., Seger, R., Skelton, S., Rutter, S., Seger, R., Skelton, S., Rutter, S., Seger, R., Skelton, S., Rutter, S., R MTV043 68848 bp DNA Mycobacterium tuberculosis AL022004 AL123456 AL022004.1 GI:3261550 Mycobacterium tuberculosis.
Mycobacterium tuberculosis Actinomycetales: Corynebacterineae: Mycob Mycobacterium: Mycobacterium tuberculosis Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; Sulston, J.E., Mycobacteriaceae; Taylor, K., complex Whitehead,S.

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Nature 39
98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2916866.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Parkhill, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Erratum:[[published erratum appears
12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complete genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Deciphering the biology of Mycobacterium tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (bases 1 to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                393 (6685),
                                                                                                                                                                                                                                                                                                                                                                                      5'-phosphoribosyl-5-aminoimidazole synthetase, similar to many e.g. pl2043|pur5_BACSU (346 aa) and Salmonella typhimurium U68765|STU68765_2 (345 aa) FASTA scores: sp|pl2043|pur5_BACSU PHOSPHORIBOSYLFORMYLGLYCINAMIDINE (346 aa) opt: 1023 z-score: 1250.3 E(): 0; 46.5% identity in 331 aa overlap; andU68765|STU68765_2 (345 aa) opt: 1014 z-score: 1239.4 E():0; 47.6% identity in 330 aa overlap. TBparse score is 0.901"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="fragment designated v043. Does not represent a physical clone" <1. .40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /strain="H37Rv"
/db_xref="taxon:1773"
<1. .67906
RHLDCWVLGTVCKGGKQGPRAKLVGQHPRF*
                            PDHYDISATGVGVVEADNVLGPDRVKPGDVIIAMGSSGLHSNGYSLVRKVLLEIDRMN
LAGHVEEFGRTLGEELLEPTRIYAKDCLALAAETRVRTFCHVTGGGLAGNLQRVIPHG
LIAEVDRGTWTPAPVFTMIAQRGRVRRTEMEKTFNMGVGMIAVVAPEDTTRALAVLTA
                                                                                                                /db_xref="SPTREMBL:053823"
/translation="MTDLAKGPGKDPGSRGITYASAGVDIEAGDRAIDLEKPLASKAT/translation="MTDLAKGPGKDPGSRGITYASAGVDIEAGDNAIDLEKPLAKATVVVRPEVILAASSDGVGTKLAIAQANDKHDTYGLDLVAMVVDLAVEGAEPLELDYIAVGRIVPERLSAIVAGIADGCMRAGCALLGGETAEHPGLIE
                                                                                                                                                                                                                                      /trans1_table=11
/product="purM"
/protein_id="CAA17615.1"
/db_xref="GI:2916867"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="purM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism≃"Mycobacterium tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Rv0809,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="purM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone="Y7H7A"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      organism="Mycobacterium tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .68848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence
5), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (MTV043.01), len: 364. purm, probable
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             in Nature 1998 Nov
                                                                                                                                                                                                                                                                                                                                   gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gene
                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
```

```
/note="Rv0812, (MTV043.04), len: 289. pabC, similar to spip28305|pABC_ECOLI 4-AMINO-4-DEOXYCHORISMATE LYASE (269 aa). FASTA scores: opt: 155 z-score: 205.5 E(): 0.00064, (26.8% identity in 198 aa overlap). Also similar to several ILVE proteins. TBparse score is 0.915"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="Rv0811c, (MTV043.03c), len: 368. Unknown but equivalent to Mycobacterium leprae hypothetical protein U2266F (366 aa). FASTA scores: U15182|MLU15182_13 (366 aa) opt: 1870 z-score: 2265.5 E(): 0, 77.4% identity in 367 aa overlap. TBparse score is 0.912"
                                                                                                           /note="Rv0813c, (MTV043.05c), len: 226. Unknown but highlysimilar to M. leprae cosmid B226gPU15182|MLU15182_16 (242aa). FASTA scores: opt: 1191 z-score: 1405.0 E(): 0; 78.3% identity in 226 aa overlap. Also similar to mtcy05a6_37, Hypothetical protein, 30.4% identity in 171 aa overlap."
                                                                                                                                                                                                                                                                                                                                                              complement(3644. .4324)
/gene="Rv0813c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="pabC"
/protein_id="CAA17618.1"
/protein_id="CAA17618.1"
/db_xref="GI:2916870"
/db_xref="SITERBH:053826"
/db_xref="SYTERBH:053826"
/translation="MVVTLDGEILQPGMPLLHADDLAAVRGDGVFETLLVRDGRACLV
/translation="MVVTLDGEILQPGMPLLHADDLAAVRGDGALRLIYSRGREGGSA
EAHLQRLTQSARLMDLPEPDLPRWRRAVEVATQRWVASTADEGALRLIYSRGREGGSA
PTAYVWVSPVPARVIGARRDGVSAITLDRGLPADGGDAMPWLIASAKTLSYAVWMAVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(1540. .2646)
/gene="Rv0811c"
                                                                                                                                                                                                                                                                                                                                  complement(3644. .4324)
                                                                                                                                                                                                                                                                                                                                                                                                                                                      RHAARQGAGDVIFVSTDGYVLEGPRSTVVIATDGDQGGGNPCLLTPPPWYPILRGTTQ
QALFEVARAKGYDCDYRALRVADLFDSQGIWLVSSMTLAARVHTLDGRRLPRTPIAEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="pabC"
2729. .3598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="poss
2729. .3598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LAGGG I VRRMPDGLAGQ I ELDVVVKRGDRADWQRRLTQAGVRPAG I WAY EAHRVAHRV PARRPRLGVDTDERT I PHEVGW I GGPGAGAVHLNKGC Y RGQETVARVHNLGRPPRMLVLHLHLDESVQRPSTGDAVLAGGRTVGRLGTVVEHVELGPVALALLKRGLPGDTALVTGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TLDGGDRQTWLHSISTQHVSDLPEGASTQNLSLDGQGRVEDHWIQTELGGTTYLDTEPWRGEPLLAYLRKMVFWSMVTPRAADMAVLSLLGPRLAEERVLDALGLDVLPAEWLAVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="hypothetical protein
/protein_id="CAA17617.1"
/db_xref="GI:2916869"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(1540. .2646)
/gene="Rv0811c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(1401.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPSDDDSWNDEDDWRR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /product="hypothetical
/protein_id="CAA17616.1
/db_xref="GI:2916868"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(1211.
/product="hypothetical protein Rv0813c"
/protein_id="CAA17619.1"
                                                                                                                                                                                                                                                                                                                                                                                                                             FAELVDAAIVSDR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EAEVAAVIDVDSLPPADDVGAGRRAVERLRGGIR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="possible RBS for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene-"Rv0810c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="pabC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="MAAVPAPDPGPDAGAIWHYGDPLGEQRAGQADAVLVDRSHRAVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="SPTREMBL:053825"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 trans!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="Rv0810c,
                                                        transl_table=11
                                                                                                                                                                                                                                                                                                     /gene="Rv0813c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       translation="MGRGRAKAKQTKVARELKYSSPQTDFQRLQRELSGTGTDRLDGD"/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="SPTREMBL:053824"
                                                                                     codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 l_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           possible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RBS for Rv0812"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (MTV043.02c), len: 60. Unknown. TBparse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              .1406)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .1393)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rv0810c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rv0811c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Rv0810c
```

```
Matches 718;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                   22411
                                                                                                                                                                                                                                                                                                                                                                                                                                                    22471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
  479
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 185
                                                                                                                                                                                                                                                                                                   299
                                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ç
                                                                                                                                                   CAGCGCCGCCGTCGCCAAGGGCGAGCAGGCCGGCGCGCCCCACCGTGCCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cggtgccgccgttccctccggccgagccggagactccgaacccgccggcggcgccgccggcac
                                                  CGGTGTGGCTTGCCCGCCGAGCCCGCCAGCGCC - - - ACCGGCTCCGAACAGCCCGC
                                                                                                                                                                                                                                                   ggtcgggcgcgagaccggttccggcggtgccgccaatgccgccagcgccgaagagga
                                                                                                                                                                                                                                                                                                                                                                                                                                                 cgtcgccgatcagcttggcggcccgccgctgccaccggacccgccgatgccgccggcca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CGCCGCCGGCCGCCGGCACCGCCGTTCCCCGGCCCCCCGGTGGCAACCGACGTGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cgatgccagtcccgccggcgccaccagcgccgccgttcaccgatccacccgccggtgccgc 64
                                                                                                tgccagttccgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctc
                                                                                                                                                                                                tgccggcgttgccgcccgcccgcccgcccccccccccacgagttggttagcgg
                                                                                                                                                                                                                                                                                                                                                   cgaacagtgcgccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tttggtccgcactggaggcgccgaaccctccggtgcccccggcg-----ccgccgggac 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CGCCGGTAGAGCCGTTGGCGAAGCCCCCAGCGCCCGCCGGACCCACCGGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="Rv0814c, (MTV043.06c), len: 100. Unknown but identical to Mycobacterium tuberculosis MTCY154.28 (100 aa). Equivalent to hypothetical M. Leprae protein 6699208 U2266J (143 aa) and similar to S.erythraea rhodanese-like protein M29612|SERCYSA.5 (101 aa). FASTA scores: Z95150|MTCY164_29 (100 aa) opt: 647 z-score: 865.3 E(): 0; 100.0% identity in 100 aa overlap; U15182|MLU15182_17 (143 aa) opt: 545 z-score: 729.4 E(): 0; 84.0% identity in 100 aa overlap; U5182|SERCYSA_5 (101 aa) opt: 345 z-score: 469.6 E():1.2e-18; 57.1% identity in 98 aa overlap; TBparse scoreis 0.853"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MCSGPKQGLTLPASVDLEKETVITGRVVDGDGQAVGGAFVRLLD SSDEFTAEVVASATGDFRFFAAPGSWTLRALSAAGNGDAVVQPSGAGIHEVDVKIT" complement(4487. .5652) /note="region identical to positions (-1) 26726-27891 of MTCY164, appropriate BAC clone coverage exists (Rv 419, Rv134, Rv45)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /translation="mssgagsdatgaggvhaagsgdravaaaverakataarnipafd
DLPVPADTANLREGADLNNALLALLPLVGVWRGEGEGRGPDGDYRFGQQIVVSHDGGD
YLNWESRSWRLTATGDYQEPGLREAGFWRFVADPYDPSESQAIELLLAHSAGYVELFY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(4487. .4789)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(4791. .5624)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(4487. .4789)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GRPRTQSSWELVTDALARSRSGVLVGGAKRLYGIVEGGDLAYVEERVDADGGLVPHLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /protein_id="CAA17620.1"
/db_xref="GI:2916872"
/db_xref="SPTREMBL:005794"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="sseC2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="sseC2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="sseC2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="GI:2916871"
/db_xref="SPTREMBL:053827"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  32.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 377.4; DB 2; Pred. No. 1.6e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches 431;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           68848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                   418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184
                                                                                                  478
                                                                                                                                                   22232
                                                                                                                                                                                                                                                                                                   358
                                                                                                                                                                                                                                                                                                                                                   22352
                                                                                                                                                                                                                                                                                                                                                                                                 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22592
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6
```

 Qy Db 80 PD

Ъ

```
KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                LOCUS
DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                 RESULT
MTV035
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                    REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                   ACCESSION
                                                                                                                                                                                                                                                                                                                  VERSION
                                       TITLE
                                                                                                                                                                                     AUTHORS
                                                                                                                                                                                                                                                                   ORGANISM
        JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21817
                                                                                                                                                                                                                                                                                                                                                                                                                                                 21518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21877
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               21994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      950
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  776
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             659
                                                                                                                                                                                                                                                                                                                                                                                                6
                                                                                                                                                                                                                                                                                                 Mycobacterium tuberculosis H3:
ALO21930 AL123456
ALO21930.1 GI:376160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CATAGGACCCCGCACCCGCGGCCAGGGCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                cgtacgcgccagcgcccgcagtaaaggtttg 1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ccccgccgttgccgaatagccccgcggcttccacctgggccgccgccgccgtggccgggcgccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCGCGTTGAACACGTCGATCAGGCTCTGCAACGGCGATGCGGCGGCAATCTCGGCGACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CGGACCCGCCGGCCGCTTGCCGATCAACCACCCGCCGGGCCCCCCGG - GGCCCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CTGCCCCACCGGCCCCTCCGATGACACCCGCGACCGCGGAGTCTCCCACCGGCCCCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tgttcccgactccgccgggccccccggcgccggagccggaacagcag-----cccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGCCGCTGGCGAACAGCCCGCCGGCCCCACCGGCCCACCACCACCAGCTGCGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               caccggctccgaacagcccggccgcccgtcgccgtcgccgagcccgc---ctgtgccgg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CGGTGCCGCCGGCCCACCGGTG----CCCGTCGATGCGAACCCGGCCGAACCCGCCGCTGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tgacgetcaaccegeeggtgeeggeeggeeggeeggeegaccaectegaacageeege
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CGCCGCTAGCGAACAGCCCTCCGGCCCCACCCGTCCCACCAACCCCACCGGTACCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         cgccattggagaacagcccgccgcccgccggtgccggtgccaccggtgcccccgt
                                                                Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C. E., Harris, D., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and
                                                                                                                                                                                                                                Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                    Barrell,B.G.
Deciphering the biology of Mycobacterium
        Nature
                     complete
                                                                                                                                                                                                 Mycobacterium; Mycobacterium tuberculosis 1 (bases 1 to 31300)
génome sequence
93 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                H37Rv complete
                                                                                                                                                                                                                                                                                                                                                                                                                                               21488
                                       tuberculosis
                                                                                                                                                                                                                   complex
                                                                                                                                                                                                                                                                                                                                                genome;
                                                                                                                                                                                                                                                                                                                                                  17-JUN-1998
segment 15/162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1069
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     21698
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   21758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             21995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             21519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21818
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                21878
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              21938
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22115
```

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE
                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                         CDS
                                                                                                                                                                                                                                                                                                                                    misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position General Markov Model of TB genes an increase in the observed/expected third position General Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Markov Mar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CBIO 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2909461.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Parkhill, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Erratum:[{published erratum 12;396(6707):190]} 2 (bases 1 to 31300)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     initiation codon
complement(931.
/gene="fadD27"
/note="Rv0275c,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Contains PS00082 Extradiol ring-cleavage dioxygenases signature near C-terminus. FASTA scores: TR:056415 (EMBL:M85195) FOSFOMYCIN-RESISTANCE PROTEIN (141 aa), opt: 82 z-score: 285.5 E(): 1.1e-08, 29.1% identity in 151 aa overlap. TBparse score is 0.914"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="Rv0274"
/note="Rv0274, MTV035.02), len: 193. Unknown, but some similarity to gplAJ002571|BSAJ2571_7 Bacillus subtilis 1 56kb DNA (316 aa), opt: 138 z-score: 174.8 E(): 0.033, 27.18 identity in 133 aa overlap. Previous hits with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note='
                                                                                                                                                                                                                                                                                                                                        840.
                                                                                                                                                                                                                                                                                                                                                                                                        /translation="mikphnintefelgginhyalvcSDMartyDfySnilgMplika
LDLPGGQGQHFFFDAGNGDCVAFFWFADAPDRVPGLSSPVALPGIGDITSAVSTMNHL
AFHVPAERFDAYRQRLKDKGVRVGPVLNHDDSETQVSAVVHPGVYVRSFYFQDPDGIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="
420..1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  409.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="taxon:1773"
<1. .30489
                                                                                                                                                                      complement(931.
                                                                                                                                                                                                                 signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
/product="hypothetical protein Rv0274"
/protein_id="cah17349.1"
/db_xref="GI:2909463"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(331.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 physical clone"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FOSFOMYCIN-RESISTANCE PROTEIN from SERRATIA MARCESCENS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /organism="Mycobacterium
/strain="H37Rv"
                                                                                                                           /gene="fadD27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note=
                                                                                                                                                                                                                                                   note="PS00082
                                                                                                                                                                                                                                                                                         /gene="Rv0274"
                                                                                                                                                                                                                                                                                                                                                                          LEFACWTKEFTTSDAQAVPKTAADRRPPVAADR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /db_xref="SPTREMBL:053680"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="fragment designated v035. Does not represent a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .1001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   possible RBS,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rv0274"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    possible RBS,
                                                                                                                                                                                                                                                   Extradiol ring-cleavage dioxygenases
    (MTV035.03c), len:
                                                                                     .1656)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   . 335)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   appears in Nature 1998 Nov
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ggagg,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ggagg,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for Rv0274"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for Rv0273c"
    241. fadD27, similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0.033;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        168
```

```
/note="Rv0277c, (MTV035.05c), len: 152. Unknown but similar to hypothetical Mycobacterium tuberculosis proteins MTCY274.03 (147 aa) and MTV006.14 (143 aa). FAST/ scores: Z74024|MTCY274_3(147 aa) opt: 357 z-score: 461.7 E(): 3.2e-18.41.4% identity in 140 aa overlap; and AL0210|MT006_14 (143aa) opt: 258 z-score: 337.6 E(): 2.6e-11; 33.8% identity in142 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Rv0276, (MTV035.04), len: 306. Unknown but similar to Mycobacterium tuberculosis MTCY427.18 (296 aa). FASTA scores: Z70692|MTCY427_1B Mycobacterium tuberculosis cosmid (296 aa) opt: 874 z-score: 1042.8 E(): 0: 49.6% identity in 282 aa overlap. TBparse score is 0.894"
                                                                                                                                                                                                /note="Rv0278c, (MTV035.06c), len: 957. Member of M. tuberculosis Gly., Alarrich PGRS subfamily of PE protein family. Similar tomany others. Contains P500583 pfkB family of Carbohydrate kinases signature 1. FASTA scores: 255890[MTCY28_25 (914 aa) opt: 3849 z-score: 2368.8 E():
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(2706. .3134)
/gene="Rv0277c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="maislvahqppiphyerpmadppriqlarrrrsaagpg::nedslm

GVALLAGPANVIMELAMPGVGYGVLESRVESGRIDRHPIKRARTTFTYVA.VAVASSDD

QKAAFRRAVKKHAQVYSTPESPVSYHAFDPELALWVAACLYKGGVDVY RFTVGEMDI

EEADHHYRAGMAMGTTLQVPPQMWPPDRAAFDRYWRQSLDRVHIDDVVRDYLYPIVAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv0276"
1746. .2666
                                                                                                                                                                                                                                                                                                                                                                                                        complement(3435. .6308)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="WFLIDVNVLLAAHRGDHPNHRTVRPWFDRLLAADDPFTVPNLVW ASFLRUTTNRRIFEITSPRADAFAFVEAVNAQPHHLPTSPGPRHIVLLKKLCDEADAS GDLLPDAVLGAIAVEHLAVVSLDRDEARFASVRHIRPPI" complement(3435. .9071)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /transi_table=11
/product="hypochetical protein Rv0277c"
/protein_id="0.8417352.1"
/db_xref="GI:2909466"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(2706. .3134)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RLMPRFVREFPFNLMLWDLDRRMRRGRPLV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="hypothetical protein Rv0276"
/protein_id="CAA17351.1"
/db_xref="61:2909465"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="poss
1746. .2666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RTICRRAGLSVRYFYESFTDKDEFVGRVFDWVVAELVATTÓAAVTAVPAREOJIKAGMA
NIVRTITADARVGRLLFSTQLANAVITRKRAESSALFAMLSGOHAVDTLHAPANDHVK
AVAHFAVGGVGQTISAWLAGDVRLDPDQLVDQLAALLDELTDPNLSRPKVAAIAAKSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     togp|AL022004|MTV043_17 Mycobacterium tuberculosis seque
(213aa), FASTA scores: opt: 230 z-score: 266.0 E():
2.7e-07; 32.6% identity in 190 aa overlap.TBparse score is
/product="PE_PGRS"
/protein_id="CAA17353.1"
                                                                                                                                        0.870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RIRGIALPGPLRRLSEGIALLITTGFLPQRFRDEMRLPWDATKQRRFDALMAVLRTVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ANDPOPPEVAGOPPSSARPARRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /protein_id="CAA17350.1"
/db_xref="GI:2909464"
                                                                                                                                                                                                                                                                                                                                                                        /gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="SPTREMBL:053683"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="Rv0277c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:053682"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv0276"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /db_xref="SPTREMBL:053681"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /product="fadD27"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           translation="MTRSDRPYRGYEAAERLATRRRQSLSAGLDLLGSDQHDTAELTI
                                                                                                         /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       possible RBS,
                                                                                                                                                                    identity in 903 aa overlap.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ggagg, for Rv0276"
                                                                                                                                                                        TBparse score
```

gene

gene CDS gene

RBS

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                            8178
                                                                             8121
                                                                                                                               8067
                                                                                                                                                                                  8007
                                                                                                                                                                                                                                    7947
                                                                                                                                                                                                                                                                                       7887
                                                                                                                                                                                                                                                                                                                                          7827
                                                                                                                                                                                                                                                                                                                                                                                            7767
                                                                                                                                                                                                                                                                                                                                                                                                                                              7707
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         misc_feature
                                                    495
                                                                                                      435
                                                                                                                                                                                                                                                                                                                                                                  135
 555
                                                                                                                                                         375
                                                                                                                                                                                                           315
                                                                                                                                                                                                                                                            255
                                                                                                                                                                                                                                                                                                                 195
                                                                                                                                                                                                                                                                                                                                                                                                                   75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15
                                                                            GCCGCCGGCGCACGC---TGAGCATGCCGGCGTCGCCGGCCCACCGTTCCC
                                                                                                                                                                                              accggttccggcgtgccgccaatgccgccgagcgccgaagagaggatgccggcgttgccgcc
                                                                                                                                                                                                                                                                                                     actggaggcgccgaaccctccggtgcccccggggccggcgggaccgaacagtgcgccggc
                                                                                                                                                                                                                                                                                                                                                                                                                                           CCCGCCTAAGCCGCCGGCCGCCGTGCCGGCGGGTGCGCCACTACCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                          cccgccggcgccaccagcgccgtcaccgatcaacccgccggtgccgccgctgcc
cccgccgcccccgccggtgccaccggtgcccccgttgacgctcaacccgcc
                                            tccggccgagccggagactccgaacccgccggcggcggcaccgccattggagaacag
                                                                                           GATCCCACCGCCACCGCCACCGTCCG-----GGTTGGATCCGCCGCTGCCGCCGGC
                                                                                                                                           cgccccgccggccccgccctcaccgcccacgagttggttagcggttgccagttccgccggt 434
                                                                                                                                                                                                                                   accgccgatgccgccgacgcctcctttgccgccggtgccgcggggtcggggcgcgag
                                                                                                                                                                                                                                                                                      GTTCGCGCTGGCGCCGTTGCCGCCGTTGCCGGCGTTGCCCGACGAGCCCGGGCGCGCCC
                                                                                                                                                                                                                                                                                                                                                      gctaccggccgcgccggacgctgtcgccgccggtaccgccggcggcggcgtcgccgat 134
                                                                                                                                                                                  740;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -GTTGATTATGCTCGTCCCGCCACTACCGCCGGTGCCGCCGGCGCGCGAACAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="Rv0279c, (MTV035.07c), len: 837. Member of M. tuberculosis Gly-, Ala-rich PGRS subfamily of PE protein family.Similar to many others. FASTA scores: z95890|MTCY28_25 Mycobacteriumtuberculosis cosmid (914
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="possible RBS, ggagg, complement(6558. .9071)
/gene="pE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(6315. .6319)
/gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="PS00583 pfkB family signature 1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(4134. .4205)
/gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HARCRRHRRAAARRERTQRLAIAGRPATTRGVEGISCSPQMMP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            32.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 376.4; D
Pred. No. 3e-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                376;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for Rv0278c'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                carbohydrate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 31300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                kinases
 614
                                                                             8177
                                                                                                                               8120
                                                                                                                                                                                                                                   8006
                                                                                                                                                                                                                                                                                                                                         7886
                                                                                                                                                                                                                                                                                                                                                                  194
                                                    554
                                                                                                      494
                                                                                                                                                                                 8066
                                                                                                                                                                                                         374
                                                                                                                                                                                                                                                            314
                                                                                                                                                                                                                                                                                      7946
                                                                                                                                                                                                                                                                                                               254
                                                                                                                                                                                                                                                                                                                                                                                                                                              7766
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9;
```

Qy Db

ду ду 29

밁

```
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DEFINITION ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
MTV023/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
      REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Locus
                                                                                            JOURNAL
MEDLINE
                                                                                                                                                                                   TITLE
                                                                REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                         AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8817
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8706
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8586
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8526
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            906
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    789
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccagcgcccgcagtaaaggtttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agccgcgccgttgccgggccgtc---acccccggccccacccgcccgccgttgccgaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          cccggccgcccgccgagccgagcccgctgtgccg-----gtgttcccgactcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gccggcgccaccgttgaagcctggcccggccggcccgccgatgccaccggctccgaacag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CCCGCCAGAGCCGCATCCCCGCCGGCGGCC-----GCCGCCAAAGATGCCGAATCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cacaatgttgagcacgtccaacggcgccgcggcggcggcctcagcgctccgcgtacgc 1136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GGCGCCGTTGGTGCCGATCAGCGGGCGCCCGGTATTCGCCAGGAAG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TCCGGCGCCGCCGTTGCCGATTAACCAGCCGCCGTCCCCGCCATTGGCCCCGGTGCCGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tagccccgcggctccacctgggccgccggcctg-----gccgggccccggaccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CCCGCCGTTTCCGCCGGCCCCGCCGGCGCCGCCGGTGGCGCCGAAAGCGGCTGCGAATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCCGGTGCCGGCGT----CGGTTGCCCCGCCGCCGCCGCCGACCCCGCCGCCGTCGGCGAACAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGGCCCACCGGTGCCGCCGGCGCCGAACAGCCCGCCGTTTCCGCCGGATCCGCCGGCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99t9ccgccggcaccgccggcggccaacacctcgaacagcccgctgcgaccgccggcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GCCGCCACCGGAGGTCAACGCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -AACTCGTTGATCGGGGCGAGCAGCGGCGAGGTGGCGGCGGCCTCGGCGGCGGCGTACGC
                                                                                                                                                                                                                                                                                                                                                                                     Harris,D.,
Tekaia,F.,
Erratum:[[published erratum appears 12;396(6707):190]] 2 (bases 1 to 47852)
                                                                                                                                                                   Hamilin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M. A., Majandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squres, R., Sulston, J.E., Taylor, K., Whitehead, S., Barrell, B.G.

Deciphering the biology of Mycobacterium tuberculosis from the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the 
                                                                                                                                                                                                                                                                                                                                                                                                                                             Cole, S.T., Brosch, R., Parkhill, J., Garnier, T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Mycobacteria; Pirmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Pirmicutes; Actinobacteriae; Mycobacteriaceae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MTV023 47852 bp DNA BC Mycobacterium tuberculosis H37Rv complete AL022022 AL123456 AL022022.1 GI:3261554
                                                                                            98295987
                                                                                                                                                       complete
                                                                                                                                                                                                                                                                                                                                                             Connor, R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium; Mycobacterium tuberculosis 1 (bases 1 to 47852)
                                                                                                                     393 (6685),
                                                                                                                                                 genome sequence
                                                                                                                                                                                                                                                                                               Gordon, S.V., Eiglmeler, K., Gas, S., Barry III, C.E., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Murphy, L., Oliver, S., Osborne, J., Onail M. A.
                                                                                                                        537-544 (1998)
                                                                'n
                                                                Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     genome; segment 148/162.
                                                                   1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17-JUN-1998
                                                                νον
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1016
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8585
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8645
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8525
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            956
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        674
```

```
FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                         CDS
                                                                                                                                                                                                        gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
                                                                                                                                                                                                                                                                                                                  RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 15A Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Koux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2924430.

Notes:

Details of M. tuberculosis sequencing at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      available on the World Wide Web.
(URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  initiation codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    complement(1...1695)
/gene="Rv3494c"
/note="Rv3494c, (MTV023.01c), len: 564. Unknown Pro-rich
/note="Rv3494c, (MTV023.01c), len: 564. Unknown Pro-rich
/note="Rv3494c, (MTV023.01c), len: 564. Unknown Pro-rich
/note="Rv3494c, (MTV023.01c), len: 564. Unknown Pro-rich
/note="Rv3494c, (MTV023.01c), len: 516 aa) and
/note="Rv3494c, (S16 aa) and
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly signal
/note="Rv3494c, len: Strate, possibly si
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /db_xref="taxon:1773"
/clone="Y13E12"
<1. .47852
                                                                                                         complement(1706.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VGVIYHKSIEQLLVVFPALFAAIITSAGGVPQDEGAKLDFKIDLHDPPPCMTGFLPPP
LVRSPADESVREIPRDMYCKTAQNDPSTVRGARNYPCQEFPGKRAPTVQLCRDPRGYV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DFVAGGGLYKNANVTYRGVAVGRVESVGLNPNGVTAHMRLNSGTAIPSNVTATVRSVS
AIGEQYIDLVPPENPSSTKLRNGFRIQRQNTRIGQDVADLLRQAETLLGSLGDTRLRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /product="hypothetical protein Rv3494c"
/protein_id="CAA17731.1"
/db_xref="GI:2924431"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /gene="Rv3494c"
complement(1..1695)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="fragment designated v023. Does not represent a physical clone"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /strain="H37Rv"
/db_xref="taxon:1773"
<1. .18
                                                                                                                                                                                                                                                                                                                  complement(1703.
                                                                                                                                                                                                                                                                                                                                                       APGPQPQASGPAYTIYDQLSGAFADPAGGTGIFAPGMTGASSAENWVDLMRDPRQL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVGTNPWRGPPIPYGTEVTDGRNILPPNKFPYIPPGADPDPGVPIVGPPPPGQVAGPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LLHEAF IATNGAGPELARLIESARLLVDEANANYPQVSQLIDQAGPFLQAQIRAGGDI
KSLADGLARFTWQLRAADPRLRDTLADAPDAIDEANTAFSGIRPSFPALAASLANLGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /db_xref="SPTREMBL:053539"
/translation="MIDRLAKIQLSIFAVITVITLSVMAIFYLRLPATFGIGTYGVSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /organism="Mycobacterium
/strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                           PAPHQPAQPAPPPNDNGPPPPFTSWMPPGYPPEPPQVPYPATTPPPPPPEGTGPPPGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                         /gene="lprN"
                                                                                                                                                                                                                                                        /note="possible RBS for Rv3494c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .47852
(MTV023.02c), len: 384. lprN,
                                                                                                         .2860)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tuberculosis'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tuberculosis"
     similar
```

```
/note="Rv3496c, (MTV023.03c), len: 451. Unknown but similar to Mycobacterium tuberculosis proteins MTCI28.12 (530 aa), MTCY19H5.30c (588 aa) (MTV051.07). Hydrophobic region at N-terminus. FASTA scores: Z97050|MTCI28_12 (53 aa) opt:838 Z-score: 711.0 E(): 4.3e-32; 35.1% identitin 473 aaoverlap; and Z97182|MTCY19H5_30 (508 aa) opt:821 Z-score:697.0 E(): 2.6e-31; 35.1% identity in 453 aa overlap.TBparse score is 0.891"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mycobacterium tuberculosis proteins MTCI28.13 (390 aa) and MTCY19H5.29 (402 aa) and (MTV051.08). Probably Lipoprotein, contains possible signal sequence and appropriately positioned PS00013 Prokaryotic membrane Lipoprotein Lipid attachment site. FASTA scores: gplZ97050 MMCI28.13 (390 aa) opt:653 z-score: 762.1 E():0; 33.6% identity in 363 aa overlap; and cprise propriately formula opt: 572 z-score: 667.9 E(): 297182 MMCY19H5_29 (402 aa) opt: 572 z-score: 667.9 E(): 1.1e-29; 31.8% identity in 362 aa overlap. TBparse score is 0.897"
                                                                                                                                                       similar to Mycobacterium tuberculosis proteins MTCY19H5.31 (481 aa), MTCL128.11, (515 aa) and MTV051.06. Hydrophobic region atN-terminus. FASTA scores: z97182|MTCY19H5_31 (481 aa) opt:611 z-score: 667.7 E(): 1.1e-29; 32.5% identity in 332aa overlap; and z97050|MTC128.11 (515 aa) opt: 587 z-score:641.2 E(): 3.3e-28; 30.1% identity in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="STTREMB::053541"
/db_xref="STTREMB::053541"
/translation="MMGRVAMLTGSRGLRYATVIALVAALVGGVYVLSSTGNKRTIVG
/translation="MMGRVAMLTGSRGLRYATVIALVAALVGGVYVLSSTGNKRTIVG
/translation="MMGRVAMLTGSRGLRYATVIALVAKTYNGVKYVVVVAVVIANTARYN
/translation="MMGRVAMLTGSRGLRYATVIAVVAVIANTARYNO"
/translation="MMGRVAMLTGSRGLRYATVIAVVAVIANTARYNO"
/translation="MMGRVAMLTGSRGLRYATVIAVALSELRYATVIAVALSELRYATVANTARYNO"
/translation="MMGRVAMLTGSRGLRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVIAVALSELRYATVA
                                                                  opt: 587 z-score: b41.2 E(). ... 335 aa overlap. TBparse score is 0.889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(4209. .5282)
/gene="Rv3497c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         attachment site"
complement(2857. .4212)
/gene="Rv3496c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LARDKDNLGRALDTLFDAVRVLNQNRDHIVDAFAALKRLTMVTSHVLAETKVDFGEDLKDLYSIVKALNDDRKDFVTSLQLLLTFFFPNFGIKQAVRGDYLNVFTTFDLTLRRIGETFTTAYFDFNMAHMDEILNPFDFLIGELANLSGQAADFFKIPFGTASGQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="possible RBS for Rv3495c" complement(4209. .5282)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(2867. .2871)
/gene="Rv3496c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AT EAKSETPVPELTWVPAGGGAPVGNPADLQSLLVPPAPGPAPAPPAPGAGPGEHGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SFDTAAGPSAPDYYRRAEICRERLGPVLRRLTVNYPPIMFHPLNTITAYKGQIIYDTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
/product="hypothetical protein Rv3496c"
/protein_id="CAA17733.1"
/db_xref="GI:2924433"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(2857. .4212)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(2798. .2830)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AKVSQTSLLGSLHVELAPPTDRPPTGRLVDGSRITEANTDRFPTTEEVFSALGVVVNK
GNVGALEEIIDETHQAVAGRQAQFVNLVPRLAELTAGLNRQVHDIIDALDGLNRVSAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="mnriwlraliltassallagcQfgglnslplpgtaghgEgaysyrvemADvatlpQnspvmvDDvtvgSvAgIvavQRpDgSfyAAvKLDLDKnvLlpAnAv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="lprN"
/protein_id="CAA17732.1"
/db_xref="GI:2924432"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="Rv3497c"
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="Rv3496c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="PS00013 Prokaryotic membrane lipoprotein lipid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="lprN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                      /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="Rv3497c,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /db_xref="SPTREMBL:053540"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (MTV023.04c), len: 357. Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               35.1% identity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (530
```

gene

misc_feature

CDS

gene

CDS

/product="hypothetical protein Rv3497c" /protein_id="CAA17734.1"

```
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                 20143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20680
                                                                                                                                            20203
                                                                                                                                                                                                                                                                                                                            20323
                                                                                                                                                                                                                                                                                                                                                                                                                    20380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CDS
                                                                                               549
                                                                                                                                                                                       489
                                                                                                                                                                                                                                                                               429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                                                                         gaacagcccgccgccccccgccggtgccggtgccaccggtgcccccgttgacgctcaa
                                                                                                                                                                 gccgcccgcccggccccgcctcaccgccacgagttggttagcggtgccagttcc
                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgtt 368
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccgggggtcgggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gtccgcactggaggcgcgaaccctccggtgcccccggcgcgcggcgggaccgaacagtgc 248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 900agtocogooggogocacoagogooggogtoacogatoaacoogcoggtgoogcoggt 68
cccgccggtgccgccggcaccgccggcggccaacacctcgaacagcccgctgcgaccgcc
                                                 CAGCCATCCGCCGTCGCCGACTCCGCCGTGTCCCGCCGGTCCCGCCGGTAGCACCGGG
                                                                                                                                       ATCGCTGCCGGCACCACCTGCCCCGCCTTGCCCGCCGGCCCGCCGGCCCGCCGGCTGC
                                                                                                                                                                                                                                                            gccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggttgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                    AGTGCCACCGACACCCCCAGAACGCCATCTCCGCCGGCCCC---GCCGGTGCCGCCTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CTGGCCGCCGGTGCCGAACCCCAACGGCACCCGCCGCCGCCTCCGGCGCTGAAGAGCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AATGGCGTTGCCGCCCTGGCCGCCGACGCCGGCCGGCCCGCCAGCGAACCCGGTACCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccgccgctaccggccgcgcgcgggacgctgtcgccggcggtaccgccgccgccgtc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GCCGGCGCCTTGGCCGCCGGTGCCGCCGGCACCACCGGAGCCGTTGATGCCGCCGGC 20621
                                                                                                                                                                                                                                  GCCGGCGCCACCGGCGGCCGGTACCGCCGGTCCCGGTACCACCCAACGCCGACC
                                                                                                                                                                                                                                                                                                                            TCCGCCGGCGCCGAGGCCGCCTGTCCGCCAGCAGCAGCAGCAGTGCGCCGCGACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGTTAGACCTGTGCTGGCGGGGGCGTCGGCCGGCCGCCTCCGGCACCGCCAGCCCCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       701;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             similar to Mycobacterium tuberculosis proteins MTCI28.10 (346 aa), MTCY19H5.32c (346 aa) and MTV051.05. Hydrophobic region at N-terminus. FASTA scores: 279050 MTCI28_10 (346 aa) opt: 755 z-score: 883.6 E(): 0; 36.8% identity in 340 aaoverlap; and z97182 MTCY19H5_32 Mycobacterium tuberculosiscosmi (275 aa) opt: 699z-score: 820.1 E(): 0; 47.0% identity in 249 aa overlap. TBparse score is 0.878"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="MLNRKPSSKHERDPLRTGIEGLVLVICVVLIAFGYSGLPFWPQGKTYDAVETDAGGITPGNSYVYSGLKVGAVSAVSLAGNSAKVTESVDRSIVVGDQSLAA
IRTDTILGERSIAVSPAGSGKSTIPLSRTTPFYTLNKVLQDLGRNANDLNRPQFEQA
LNVFTQALHDATPQVRGAVDGLTSLSRALNRRDEALQGLLAHAKSVTSVLSERAEQVN
KLVEDGNQLFAALDARRAALSALISGIDDVAAQISGFVADNRKEFGPALSKLNLVLAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(5272. .6324)
/gene="Rv3498c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement(5272. .6324)
/gene="Rv3498c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNERRDYITEALKRLPTYATTLGEVVGSGPGFNVNVYSVLPGPLVATVFDLVFQPGKL
PDSLADYLRGFIQERWIIRPKSP"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="hypothetical protein
/protein_id="CAA17735.1"
/db_xref="G1:292435"
/db_xref="SPTREMBL:053543"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="Rv3498c, (MTV023.05c), len: 350. Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /db_xref="GI:2924434"
/db_xref="SPTREMBL:053542"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            31.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 367.2; DB 2; Pred. No. 8.8e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rv3498c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    47852;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33
;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                             488
                                                                                                                                                                                                                                                                                                                                                                     428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  128
                                               20084
                                                                                                                                       20144
                                                                                                                                                                                    548
                                                                                                                                                                                                                                  20204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20561
                                                                                                                                                                                                                                                                                                                            20264
                                                                                                                                                                                                                                                                                                                                                                                                                    20324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5
```

рb

04 04 05

В

ρ

Qy Qy Db Db Db

. 04 B

```
REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT
MTCY493
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                KEYWORDS
SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q<sub>y</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Dþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                  REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VERSION
                                                                                                                       JOURNAL MEDLINE
                                                                                                                                                                           TITLE
                                                                                                                                                                                                                                                                                                                               AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                  ORGANISM
                      JOURNAL
                                        TITLE
                                                                                                         REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19963
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20083
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             969
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                909
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    789
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            caggccctccaacggcgccgcggcggcggcctcagcgctccgcgtacgcgcccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GTTGCCGAACAGCAGACCGCCGGCCCCGCCGGCCCGGGAGTCGTCG---CATTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gttgccgtacagcagcccgccggcccgccggcttgcccggtccccggtgcgccgttggc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gccgggccccccggcggccgcggagccgaacagcagcccggccggcccggcccggcccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GATCAAACCACCGGGCCCGGCCGGCCGGTGCCGCC-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCCGCCGTCGCCGCCCCACCGCACCGCGCGGCGGAACAGCTCGGCGGCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ACTCAAGGCCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     agtaaaggtttg 1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CA-----CGATCTGCTCAGCGGCGGCCGCCGCCGAGGCATATGCGCCCGCGGCCGGT 19574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TCCGGCGGGCCCAGGCCCGGCCTGGCCGGGCGCCCCGGCTGCCCCGGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ccccgcggctccacctgggccgccggcctggccgggccccggcccggccccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----CGCCGGTGCCCCACCGCTGCCGCCGGCCCGCCGGCCCGTTGCCCCACAA 19805
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gaacagcccggccgcccgccgtcgccgccgagcccgcctgtgccggtgttcccgactcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Cole,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C., Harris,D., Gordon,S.V., Eiglmeier,K., Gas,S., Barry III,C.E., Tekaia,F., Badcock,K., Basham,D., Brown,D., Chillingworth,T., Connor,R., Davies,R., Devlin,K., Feltwell,T., Gentles,S., Hamlin,N., Holroyd,S., Hornsby,T., Jagels,K., Krogh,A., McLean,J., Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A., Rajandream,M.A., Rogers,J., Rutter,S., Seeger,K., Skelton,S., Squares,S., Sqares,R., Sulston,J.E., Taylor,K., Whitehead,S. and Barrell,B.G.
                                                                                                                                                                                                                                                                                                                                             Mycobacterium tuberculosis.

Mycobacterium tuberculosis

Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae;

Mycobacterium; Mycobacterium tuberculosis complex.

1 (bases 1 to 40790)
                   Direct Submission Submitted (11-JUN-1998)
                                                                                                                                      complete genome sequence
Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mycobacterium tuberculosis H37Rv complete Z95844 AL123456 Z95844.1 GI:3250713
   tuberculosis sequencing
                                                        Parkhill, J.
                                                                                      Erratum:[[published erratum 12;396(6707):190]]
                                                                                                                         98295987
                                                                                                                                                                         Deciphering the biology of Mycobacterium
                                                                    (bases 1 to 40790)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    40790 bp
Submitted on behalf of the Mycoba and mapping teams, Sanger Centre,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DNA
                                                                                                        appears
                                                                                                         in
                                                                                                         Nature
                                                                                                                                                                           tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ---ACCGGCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 segment 63/162.
                      Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19-JUN-1998
       Wellcome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1028
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        19628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          20024
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              19745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     788
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     19916
```

gene CDS

```
COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the content of the conten
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 24, 1998 this sequence version replaced gi:2131042.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             , http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have renumbered from the original cosmid submissions but the old designations are in brackets after the new gene numbers.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /translation="MTVVPGAPSRPASAVSRPSYRQCVQASAQTSARRYSFPSYRRPPAEKLVFPVLLGILTILLSACQTASASGYNEPRGYDRATIKLVFSMDLGMCLNRFTYDS
KLAPSRPQVVACDSREARIRNDGFHANAPSCMRIDYELITQNHRAYYCLKYLVRVGYC
YPAVTTPGKPPSVLLYAPSACDESLPSPRVATALVPGTRSANREFSRFVVTEIKSLGA
GGRCDSASVSLQPPEEIEGPAIPPASSQLVCVAPK"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene=
775. .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Binding-protein-dependent transport systems inner membrane comp signature. The code of the comp start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="Rv1424c"
/note="pr717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="Rv1424c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Mycobacterium
/strain="H37RV"
/db_xref="taxon:1773"
/clone="Y2184"
                                                                                            /transI_table=11
/transI_table=11
/product="hypothetical protein Rv1425"
/protein_id="can90245.1"
/db_xref="GI:2131071"
                                                                                                                                                                                                                                                                                                                                         overlap'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                inner membrane
775. .2154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="hypothetical protein Rv1424c"
/protein_id="CAB09246.1"
/db_xref="GI:2131072"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="Rv1424c, (MTCY21B4.42c,MTCY493.30),
Possible membrane protein, contains PS00402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /strain="H37Rv"
/db_xref="taxon:1773"
/clone="Y493"
/db_xref="SPTREMBL:P71694"
/translation="MKRLSSVDAAFWSAETAGWHMHVGALAICDPSDAPEYSFQRLRE
                                                                                                                                                                                                                                                                                                                                                                      /note="Rv1425, (MTCY21B4.43,MTCY493.29c), len: 459.
Similar to many M. tuberculosis hypothetical proteins e.g.
MTCY28.26, fasta scores; E(): 0, 36.3% identity in 460 aa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /gene="Rv1424c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        complement(520. .606)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /db_xref="SPTREMBL:P71693"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                <1. .1638
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /organism="Mycobacterium
                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="PS00402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ocation/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rv1425"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Binding-protein-dependent transport systems comp signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               len: 253.
```

gene CDS

gene

complement(5049. .5876)

128c, (MTCY493.26), len: 275. Unknown, some to YV29_MYCTU Q11167 hypothetical 39.3 kd

/gene="Rv1428c"

RBS

complement(5048.

.5050)

/note="possible RBS upstream of Rv1427c"
complement(5049. .5876)

misc_feature

```
long chain long-chain-fatty acid coA ligase similar to eg. PC60_YEAST P38137 peroxisomal-coenzyme a synthetase (543 aa), fastascores; opt: 507 z-score: 579.4 E(): 2.9e-25, 30.48identity in 365 aa overlap Contains PS00455 Putative AMP-bindingdomain signature. Also similar to many M. tuberculosisproteinseg. MTCY06A4.14 (44.8% identity in 525 aa overlap)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
/product="lip0"
/product="lip0"
/protein_id="Ca809244.1"
/protein_id="Ca809244.1"
/db_xref="GI:2131070"
/db_xref="SUTREMBL:006832"
/translation="MRFRRMARPRPLITRAAVELLNAANGLRPLSGSGYSTVLAFWLGW
/translation="MRFRRMARPRPLITRAAVELLNAANGLRPLSGSGYSTVLAFWLGW
/translation="MRFRRMARPRPLITRAAVELLNAANGLRPLSGSGYSTVLAFWLGW
complement(4422. .4457)
/gene="fadD12"
/gene="ps00455 Putative AMP-binding domain signature"
                                                                                                                                                                                                                                      VDALLAVNRIGAHILLLNTSFAGPALAEVVTREGVDTVVYDEEFSATVDRALAEKPOA
TRIVAMTDEDHDLTVEKLVAAHAGRREHTGSHGKVILLTSGTTGTPKGAFHSGGGIG
TLKAILDRTPWRAEEVTVIVAPMFHAWGFSQLVLAASSLACTIVTRRFEDPEÄILDLID
RHHGTGLVVVPWMFDRIMDLPAEIRNRYDGRSLRFAAASGSRWRDDVVLAFMDDFGDV
IYNNYNATEAGMIATATPADLRTAPDTAGRPAEGTEIRILDQOFTEVPTGEVGTIYVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(3438. .5045)
/gene="fadD12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FQPGFEQVDTSVAAAVPVYGRYDWFTTDAPGRREEFVGLLETFVVKRKFSTHRDIFVDA
SPIHHVRADAPPFFVLHGRHDSLIPVAEAHAFVEELRAVSKSPVAYADLPHAQHAFDV
FGSPRAHHTAEAVARFLSWYYATNPPAT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               29.3% identity in 191 aaoverlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               region to AAAD_HUMAN P22760 arylacetamide deacetylase (aa), fasta scores; opt:210 z-score: 248.8 E(): 7.6e-07,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MTCY21B4.16chighly similar esp. in C-terminus to M. tuberculosis hypothetical protein Q50681 (431 aa) (50.1% identity in 411 aa overlap), and also similar in Ctultral
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(2176.
/gene="lip0"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QKRDELPAKPLIAQIPVSTRSEETKADVGNQVSSMTASLATHIEDPAKRLAAIHESTL
SAKEMAKAPSAHQIMGLTETTPPGLLQLAARAYTASGLSHNLAPINLVVSNVPGPPFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GRLMSYKLDRSRPLWELWVIEGVEGGRIATLTKMHHAIVDGVSGAGLGEILLDITPEPRPPQQETVGFVGFQIPGLERRAIGALINVGIMTPFRIVRLLEQTVRQQIAALGVAGKP
                                                                                                                                                             NDSQFDGYTSGAAKDFHAGFMSSGDVGYLDENGRLFVVGRDDEM1VSGGENIYPIEVE
KTLATHPDVAEAAVIGVDDQQYGQRLAAFVVLKPGVSATPETLKQHVRDNLANYKVPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(3438. .5045)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ANLADIWRRRDLPRDAKAPYLIYQYPGGAWYLGWRRPQAYPLMSHLAARGWYCYSLNYR
YSPRHTWPDHIYDVKRALAWYKENIAAYGGDPNFYAISGGSAGGHLCALAALTPNDPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VLEAGLTEQLGPDYAKELATLPTEPMRSRGRNLPLRTAMARRRYVETTNVVCYGPYGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Rv1426c, (MTCY493.28), len: 420. Unknown, possibleesterase, similar to MTCY493.28, MTCY08D5.15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(2176.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ARYFEAPKTRFNAPVSPHRRVTGTRVELARAKAVKDAFGVKLNDVVLALVAGAARQYL
                                                                                                                                 DIAVLDELPRGITGKILRTELQSRVGS"
                                                                                                                                                                                                                                                                                                                                                                                                                                        FAGAARRCPDRPGLIDELGTLTWRQLDERGNALAAALQALPAGPPRVVGIMCRNHRGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="fadD12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="fadD12"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LAELERAAE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LYMAGARLDSLVPLGPPVMDVALNITCFSYQDYLDFGLVTTPEVANDIDEMADAIEPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LIIERLPEIPQLRWRVTGAPLGLDRPWFVEDEELDIDFHIRRIGVPAPGGRRELEELV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="MRIRQAFGLIATMRRAGLIAPLRPDRYLRIVAAMRREGMGFTAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="GI:2131069"
/db_xref="SPTREMBL:006831"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /protein_id="CAB09257.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="Rv1427c, (MTCY493.27), len: 535. fadD12, Possible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="lip0"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .3438)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .3438)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (398
```

```
Query Match
Best Local Similarity
Matches 698; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34532
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             34472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RBS
                                                                                                              548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          77
                                                                                                                                                                                                                                                                                                                                                                                                    cyccyayaccyyttccyycyytyccyccaatyccyccaycyccyaayayyatyccyycyt 367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        taccggccgcgcccggacgctgtcgccgccggtaccgccggcggccgccgatca 136
                     acccgccgtgccgccgccaccgccacaccctcgaacagcccgctgcgac
                                                                        agaacagccgccgccggtgccgccggtgccaccggtgcccccgttgacgctca
                                                                                                                                                                       cgttccctccggccgagccggagactccgaacccgccggcggcgccgccggcaccgccattgg
                                                                                                                                                                                                                            CTCCGGTGCCGCCATCGCCGGCGTCGCCGCCGACCCCACCGGACGTACCGTGCGGGGACA
                                                                                                                                                                                                                                                cgccggtgccgccggtcccgccgttgccggtgaagatgccgccgtcgcctccggtgccgc
                                                                                                                                                                                                                                                                                                     cggcaccgccgatgccgccgacgcctcctttgccgccggtgccggcggggtcggg---cg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GCCCGCCGGCCCGCCCGCCGTTACCGCCGGCTTTGCCGCCCGATGAGAAGTTGGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gcttggcgccccgccgctgccaccggacccgccg---atgccgccgccgctttggtccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAGGCGGGGCACCGGGGGGCGCGCGCGCGCGCGCGCCATTGCCGACCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CGCCGCCCTTACCGCCAGCGCCGCCAGCTCCGCCGCCACCGCCGTTAGGGTCGCCGCCAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccgccgctgccgccgc 76
                                                                                                                                                 AGTCCTCACCGGCTGCCGCCACACCCTCCGCCGCCGTGTCCGCCGCCACCACCGTGCC
                                                                                                                                                                                                                                                                                                                                                                              CGCCGTTATCCCCAGCGACAATCAAGGCACGAGAAAATCCGGCCCCGCCGGCCCGCCGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="Rv1429"
5995...7263
/gene="Rv1429"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="5982...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DLFRRTGYIRATRENAAKALRSGGVVVVFPGGDYDAYRPTFAENVIDFNGRKGYVSTA
VEAGVPIVPAVSIGGQESQLYLSRGTWLARRLGLKRLLRSDILPISFGFPFGFSAAIP
PNLPLPAKIVMQVLDPINLTKQFGEDPDVDAVDEHVRSVMQQALNDLAAKRRFPILG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /translation="msetdspgngddagigdigkfdpgLtqrLisvLrpvLktyHrsq
VHGLDSFPPGGALVVANHSGGMFPMDVPVFSVDFYDKFGYDRPVYTLSHDILFMGLTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protein cy20g9.29 (358 aa), fasta scores; opt:
z-score: 413.6 E(): 5e-16, 32.6% identity in 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement (5882.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="hypothetical protein
/protein_id="CAB09256.1"
/db_xref="GI:2131068"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="Rv1429, (MTCY493.25c), len: 422. Unknown,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /db_xref="SPTREMBL:006830"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        31.1%;
61.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .7263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'possible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              possible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches 412;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RBS upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RBS upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  360.8; DB 2;
No. 2.5e-16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     . 5885)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of Rv1429"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of Rv1428c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          40790;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        250
                                                                                                                                                                                                                                                                487
                                                                                                                                                                                                                                                                                                                                                                              34711
35011
                                                                        34951
                                                                                                                                                                                       547
                                                                                                                                                                                                                          34831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34591
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6;
```

밁 Š 밁 δÃ В Ş рь Ş 망

δÃ В δÃ DЬ Q B Qy В δÃ

٠ ٥ ₽

CDS have

```
REFERENCE
AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DEFINITION
ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MTCY63/c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
                                                                                                                                                                                                                                                                                   JOURNAL
MEDLINE
REMARK
                                                                                                                                                                                                                                                                                                                                                                     TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            35420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 35012
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGGCATTGAGCACGTTGTGCTCCAGCGTCGCCAACGGTGCGGCGTTGGTCGCCTCCGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 caatgttgagcaggccctccaacggcgcccgcggcggcctcagcgctccgcgtacgcgc 1138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               cggccccgccgttgccgtacagcagcccgccggcccgccggcttgcccggtccccggtg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TGCCGAACAACCCGGCGGCCCGCCGGCCCGCCGACTTGGCCGGGCGCGCCCGAGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tgccgaatagccccgcggctccacctgggccggcctggccgggcccgggcccggacccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cggcccgccagccgcgttgcccgggccgtcacccccggcccacccgccgccgt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tcccgactccgccgggccccccggcgccgccggaacagcagcagccggccggcccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ctccgaacagcccgccgcccgccgtcgccgccgagcccgcctgt-----gccggtgt
                                                            On Jun
Notes:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MTCY63

Mycobacterium tuberculosis
296800 AL123456
296800.1 GI:3261800
Details of M. tuberculosis sequencing at the Sanger available on the World Wide Web.

(URL, http://www.sanger.ac.uk/Projects/M_tuberculosi
                                                                         Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2275048.
                                                                                                                                                                                                                                                                                                                                                            Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III.C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Deviln, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rajandream, M.A., Rogers, J., Rutter, S., Seger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and Barrell, B.G.
Deciphering the biology of Mycobacterium tuberculosis from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Firmicutes; Actinobacteriae; Mycobacteriaceae;
                                                                                                                                                                                                     Parkhill, J.
Direct Submission
                                                                                                                                                                                                                                                                                                      Nature 393 (6685),
98295987
                                                                                                                                                                                                                                                              Erratum:[[published erratum 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                complete genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium.
                                                                                                                                                                                                                                               (bases 1 to 38900)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 38900)
                                                                                                                                                                                                                                                                                                                           sequence
5), 537-544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         H37Rv complete
                                                                                                                                                                                                                                                                                     appears
                                                                                                                                                                                                                                                                                     ä
                                                                                                                                                                                                                                                                                     Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       segment 16/162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        35359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     35191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 35071
```

```
FEATURES
                                                                                                       gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                      CDS
                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13by before the initiation codon). If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CAUTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                renumbered from the original cosmid submissions but the old designations are in brackets after the new gene numbers prediction was based on a Hidden Markov Model of TB genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="Rv0297, (MTCX63.02), len: 591. Unknown Gly, Ala-rich protein belonging to the PRS family (PE). Many relatives in M. tuberculosis. FASTA results: Y03A_MYCTU 010637 hypothetical glycine-rich 49.6 kd pro (603 aa) opt 1884; E(): 0; 53.7% identity in 635 aa overlap. TBparse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SVLSGPVGDSGNGGAGGDGGAGVSATD I AGTGGRGGNGGHGGLWI GNGGDGGAGGVGG
VGGAGAAGA I GGHGGDGGSVNT P I GGSEAGDGGKGGLGGDGGGRG I FGQFGAGGAGGA
GGVGGAGGAGGTGGGGGNGGA I FNAGTPGAAGTGGDGGVGGTGAAGGKGGAGGSGGVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FGNGGNGGDGAGANGGAGGTAGWFFGFGGNGGAGGIGVAGINGGLGGAGGDGGNAGF
FGNGGNGGMGCAGAAGVNAVNPCLATPYTPAANGGNGLMLYGVPGTAGGGADGANGSA
IGQAGGAGGDGDASTSGGIGIATOFGGAGGAGGAGGDGAPGGNGGNGGSVSTHTGATSS
SASGGNGATGGNGGYGAPGGAGGNGGHYSGGSVNTAGAGGKGGNGGTGGAGGPGGHGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1884; E(): 0; 5
score is 0.850
                                                   /gene="Rv0299"
2224. .2526
                                                                                                                                                                                                                                                                                                                             TBparse score is 0.891"
                                                                                                                                                                                                                                                                                                                                                                                                                       /gene-"Rv0298"
2000. .2227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="possible RBS, AGGA, 2000. .2227
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DEVSTAVAALFSSHAQAYQAASAQAAAFHAQVVRTLTVDAGAYASAEAANAGPNMLAA
VNAPAQALLGRPLIGNGANGAPGTGQAGGDGGLLFGNGGNGGSGAPGQAGGAGGAAGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="PE_PGRS"
/protein_id="CAB09596.1"
/db_xref="GI:2193918"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="PE_PGRS"
82. .1857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="possible 82. .1857
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /organism="Mycobacterium
/strain="H37Rv"
/db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        In some cases we may not have predicted the correct
                                                                                                                                   ALRDYTAKTVPALDIDAYAQRVYQANRAAGS"
                                                                                                                                                                                                          /product="hypothetical protein Rv0298"
/protein_id="CAB09590.1"
/db_xref="GI:2193919"
                                                                                                                                                                                                                                                                                                                                                                      /gene="Rv0298"
/note="Rv0298,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GATGADGAKGLDGATGGKGNNGNPG'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="SPTREMBL:007224"
/translation="MSFVIAQPEMIAAAAGELASIRSAINAANAAAAQTTGVMSAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /strain="H37Rv"
/db_xref="taxon:1773"
  /note="Rv0299,
                        /gene="Rv0299"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /clone="Y63"
                                                                                                                                                         translation="MTKEKISVTVDAAVLAAIDADARAAGLNRSEMIEQALRNEHLRV"/
                                                                                                                                                                                       /db_xref="SPTREMBL:007225"
                                                                                                                                                                                                                                                                                               /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene="PE_PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            organism="Mycobacterium"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Location/Qualifiers
                                                                                                                                                                                                                                                                                                                    codon_start=:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .38900
                                                                                                          2526
(MTCY63.04), len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RBS, GGAGG,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for Rv0298"
                                                                                                                                                                                                                                                                                                                                                                        len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for Rv0297"
  100.
                                                                                                                                                                                                                                                                                                                                                                        75.
                                                                                                                                                                                                                                                                                                                                                                   Function: unknown
Function: unknown.
```

```
/gene="Rv0301"
2792 ..3217
/gene="Rv0301"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="RV0302, (MTCY63.07), len: 210. Function: unknown but similar to several repressors and regulatory proteins. FASTA results: ACRR_ECOLI F34000 potential acrab operon repressor (215 aa) opt: 172; E(): 3.Le-05; 22.7% identity in 194 aa overlap. TBparse score is 0.896. Also similar in N-terminus to M. tuberculosis hypothetical regulator MTCY07A7.24 (38.7% identity in 62 aa overlap). Contains probable helix-turn helix motif from aa 36-57"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Rv0301, (MTCY63.06), len: 141. Function: unknown, has similarity to other hypothetical M. tuberculosis proteins. FASTA results: YW07_MYCTU 010847 hypothetical 14.7 kd protein cy39.07c (132 aa) opt: 99; E(): 1; 28.1% identity in 135 aa overlap; MTCY159.10c (37.9% identity in 116 aa overlap), [MTV002_23.TBparse score is 0.928"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="Rv0300"
2574. .2705
                                                                                                 /gene="Rv0303"
3982. .4890
                                                                                                                                                                                                                                                                             /translation="MGVPAKKKQQQGERSRESILDATERLMATKGYAATSISDIRDAG
GLAPSSIYWHFGSKEGVLAAMMERGAQRFFAAIPTWDEAHGPVEQRSERQLTELVSLQ
SQHPDFLRLFYLLSMERSQDPAVAAVVRRVRNTAIARFRDSITHLLPSDIPPGKADLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="Rv0302"
3353. .3985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MTDQRWLIDKSALVRLTDSPDMEIWSNRIERGLVHITGVTRLEV
GFSAECGEIARREFREPPLSAMPVEYLTPRIEDRALEVQTLLADRGHHRGPSIPDLLI
but similar to NADPH dehydrogenase and other NADPH oxidoreductases. FASTA results: Q42850 NADPH DEHYDROGENASE
                                                                                                                                                                                                                                                                                                                                                       /transl_table=11
/product="hypothetical protein
/protein_id="CaB09599.1"
/db_xref="G1:2193923"
/db_xref="SPTREMBL:007229"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="hypothetical protein
/protein_id="CAB09598.1"
/db_xref="GI:2193922"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MIAPGDIAPRRDSEHELYVAVLSNALHRAADTGRVITCPFIPGRVPEDLLAMVVAVEQPNGTLLPELVQWLHVAALGAPLGNAGVAALREAASVVTALLC"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3353. .3985
/gene="Rv0302"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3338.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2792.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VTVTAADLRRLRGAVAGLGDPELMRQAWR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="hypothetical protein Rv0300"
/protein_id="CAB09591.1"
/db_xref="GI:2193921"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
/product="hypothetical protein
/protein id="CAB09597.1"
/db_xref="GI:2193920"
                                                                                                                                                                                                        /gene="Rv0302"
                                                                                                                                                                                                                                                        VAELTAFAVALSDGVYFAGHLEPDTTDVERMYRRLRQALEALIPVLLEET"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AATAELSGLTVLHVDKDFDAIAALTGQKTERLTHRPPSA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      translation="MSDVLIRDIPDDVLASLDAIAARLGLSRTEYIRRLAQDAQTAR/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="Rv0300, (MTCY63.05),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="Rv0300"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:007226"
                                                  /note="Rv0303,
                                                                          /gene="Rv0303"
                                                                                                                                                                           'note="
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /db_xref="SPTREMBL:007228"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              db_xref="SPTREMBL:007227"
                                                                                                                                                      possible.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 3985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                .3341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .3217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      possible
                                               (MTCY63.08),
                                                                                                                                                                              RBS,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAGG,
                                                                                                                                                                              GGAGG,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      for Rv0302"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  len:
                                                  len:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rv0299"
                                                                                                                                                                                                                                                                                                                                                                                                                                      Rv0302"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rv0301"
                                                  302.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  73. Function: unknown."
                                                  Function:
                                                  unknown
```

gene CDS

RBS

gene

RBS

CDS

gene

CDS

gene

```
Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1049
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1469
                                                                                                                                                                                                                                                                                                   929
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4 togatgccagtcccgccggcgccaccagcgccgccgtcaccgatcaacccgccggtgccg
atgccaccggctccgaacagcccggccgccccgcgtcgccgccgagcccgcctgtgccg
                                                                                                                               GTGGCCAGGCCGGGATTGACGCGGTTCACGCCGGCCGCCCCGGCCCCCATGCCGCCG
                                                                                                                                                  ccgctgcgaccgccggccgccgccgccgttgaagccttggcccgccgccgccg
                                                                                                                                                                                                                                                                                                                      gcaccgccattggagaacagcccgccgccccgccggtgccggtgccaccggtgccc
                                                                                                                                                                                                                                                                                                                                                                                  CCCCCGGTTTGCGCGATCCCGATGCCCCCACTCGTGGAGGCGTTGCCGCCGTCACCGCCA
                                                                                                                                                                                                                                                                                                                                                                                                        cctccggtgccgccgttccctccggccgagccggagactccgaacccgccggcggcgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9c9gtgccagttccgccggtgccgccgttgccggtgaagatgccgccgtcg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTGGCACCATTGCCGCCGCTCGCAGAGGAGCCGGTAGCGCCAGTGTGCTCGACGCTGCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aggatgccggcgttgccgcccgcccgcccgcccgcccccccgcccacgagttggtta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         999tcg99cgcgcc---gagaccggttccg9cggtgccgccaatgccgccagcgccgaag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              atttggt-----ccgcactggaggcgccgaaccctccggtgcccccggccgccgcggga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ccgtcgccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccggcc 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGGGAACGCCGA----CGAGGTTGAGGCCGTTGCCGCCGTTGGCCGCCGGGGTGACCGGG
                                                                                                                                                                                                                                                     ccgttgacgctcaacccgccggtgccgccggcaccgccggcggccaacacctcgaacagc
                                                                                                                                                                                                                                                                                                GCGCCGCCCTGGCCAATGGCACTGCCGTTGGCGCCATCGGCGCCGCCACCGGCGGTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CTGACGTGGCCGCCGTTGCCGCCGGCACCGGCGCGCACCGACCCGCCGTTCCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CCGCCGGTGCCGCTTGCCGCCTTTGCCACCGGCGCCGGCTGTGTTGACCGATCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTGCCGGCGATATCGGTGGCGCTAACCCCGGCCCGCCGCCGCCGGCCACCACCGTTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCGTCGCCGCTTGCCGATCCACAGCCCGCCATGACCACCGTTGCCGCCGCCGCCCCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /db_xref="SPTREMBL:007230"
/translation="MMTGTAVUTGASSGLIGLQCARALLRRDASWHVVLAVRDDARGRA
/translation="MMTGTAVUTGASSGLIGLQCARALLRRDASWHVVLAVRDDARGRA
AMEELGEPURCSVLEVDLASVRSVRSFVETVRTTPLPPIRALVCNAGLQVVSGIAFTD
DGVEMTFGVNHLIGHFALVTGILDWLARPARIVVVSSCTHDPSKHTGMPDPRYTCAADL
AHPPTDQNTPAEGRRRYTTSKLCNVLFTYELDRRLDHGEQGVMVNAFDPGLMPGSGLA
AHPPTDQNTPAEGRRRYTTSKLCNVLFTYELDRRLDHGEQGVMVNAFDPGLMPGSGLA
AHPPTDQNTPAEGRRRYTTSKLCNVLFTYELDRRLDHGEQGVMVNAFDPGLAKARIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="hypothetical
/protein_id="CAB09592:
/db_xref="GI:2193924"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(4898. .14459)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SSAESYDRAKALDLWETSERLLAQVT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (EC 1.6.99.1) (395 aa) opt: 347; E(): 3.8e-16; 35.4% identity in 319aa overlap. TBparse score is 0.905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        30.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 347.8; DB 2
Pred. No. 1.7e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches 462;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       يد protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1290
                                                                                                                                                                                                              813
                                                                                                                                                                                                                                                                                                                                                                                                                           534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
```

DP QA B 64 B 64 B 64 B

 Db

 Qy

 Db

 Db

 Db

 Db

 Db

 Db

 Db

. Qy Qy

implemented in TBparse (Krogh) supplemented with visual inspection

```
VERSION
KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MTCY21B4
LOCUS
                                                                                                                                                   COMMENT
                                                                                                                                                                                                                                                                                                                     REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DEFINITION
                                                                                                                                                                                                                                                                            AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                JOURNAL
MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE
                                                                                                                                                                                                                                                         JOURNAL
                                                                                                                                                                                                                                                                                                                                                              REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   955
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium tuberculosis H. Z80108 AL123456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GCTCCCGCGTCCACGGTCAGGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcgccagcgcccgcagtaaaggt 1157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTGACCGCGGCCAGCATG----TTCGGCCCGGCGTTGGCGGCCTCGGCGCTGGCATAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ttcacaatgttgagcaggccctccaacggcgccgcggcggcggcgctcagcgtac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCGCCGTTGCCGCCGTTGCCGAACAACAGCCCACCGTCGCCGCCGGCCTGCCCGGTGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGTTGATGCCGGCAACACCGATCCCGCCGGCCGCCGTTGCCGCCGAAGCCGAAGAAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCGTTGCCGAAGAACCCGGCCGCCGCCGGCCGGCCGGCCTGTCCGGGTGCGCCGGAC
                                                                                                                                        Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcon Trust Genome Campus, Hinxton, Cambridge CB10 1SA Unite de Genetic Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk On Jun 26, 1998 this sequence version replaced gi:1542891.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Cole,S.T., Brosch,R., Parkhill,J., Garnier,T., Churcher,C., Harris,D., Gordon,S.V., Eiglmeier,K., Gas,S., Barry III.C.E., Tekaia,F., Badcock,K., Basham,D., Brown,D., Chillingworth,T., Connor,R., Davies,R., Devlin,K., Feltwell,T., Gentles,S., Hamlin,N., Holroyd,S., Hornsby,T., Jagels,K., Krogh,A., McLean,J., Moule,S., Murphy,L., Oliver,S., Osborne,J., Quail,M.A., Rogers,J., Rutter,S., Seeger,K., Skelton,S., Squares,S., Sqares,R., Sulston,J.E., Taylor,K., Whitehead,S. and Barrell,B.G.
                   been renumbered from the original cosmid submissions but the gene designations are in brackets after the new gene numbers.
                                                                                                                                                                                                                                                                                                                                                                                                                       Deciphering the biology of Mycobacterium complete genome sequence
    Gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium tuberculosis
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                  available on the World Wide Web
                                                                                                     Notes:
Details of M. tuberculosis sequencing
                                                                                                                                                                                                                                                                            Direct Submission
                                                                                                                                                                                                                                                                                                                                    Erratum:{[published erratum appears 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mycobacterium.
                                                              (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                   (bases 1 to 39150)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1 to 39150)
prediction was based on a Hidden Markov Model of TB genes
                                                                                                                                                                                                                                                                                                                                                                                                   te genome sequence
393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            H37Rv complete
                                                                                                                                                                                                                                                                                                                                                              ij
                                                                                                       at
                                                                                                                                                                                                                                                                                                                                                              Nature
                                                                                                     the Sanger
                                                                                                                                                                                                                                                                                                                                                                                                                                              tuberculosis from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              segment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23-JUN-1998
segment 62/162.
                                                                                                                                                                                                             Genetique
                                                                                                                                                                                                                                   Wellcome
                                                                                                          are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1074
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1014
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          513
                                         old
```

```
FEATURES
                                                                                                                                                      gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gene
                                                                                                    CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              of positional base preference in codons, especially where there an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon) of this cannot be identified we choose the initiation.
                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Rv1386, (MTCY21B4.03), len: 102. Member of M. tuberculosis PE family, similar to many e.g. G913039 ORF 3' OF PGRS TANDEM REPEAT [polymorphic GC -rich sequence)(100 aa), fasta scores, opt: 149, E(): 0.0013, (31.5% identity in 92 aa overlap), also G699138 U1756A (99 aa) (34.7% identity in 95 aa overlap) and G466937 U1620K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1722. .2030
/gene="PE"
/note="Rv1386,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 If this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="pyrf"
/note="Rv1385, (MTCY21B4.02)
5'-phosphate decarboxylase,
DCOP_MYCBOP42610 (274 aa); c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /gene='
/note="Rv1387, (MTCY2184.04), len: 539, Member of M. tuberculosis PPE family of protein, similar to many Y05F_MYCTU Q10892 hypothetical 46.9 kd protein cy251
                                                                                                  /gene="PPE"
2027. .3646
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note="possible
1722. .2030
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GVQGGRPEALGGLGGAASSQLLPAVAREVLRAGPGVPELRAAGERMRDAVAYLAAV"
970. .1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /translation="MTGFGLRLAEAKARRGPLCLGIDPHPELLRGWDLATTADGLAAF
CDICVRAFADFAVVKPQVAFFESYGAAGFAVLERTIAELRAADVLVLADAKRGDIGAT
MSAYATAWVGDSPLAADAVTASPYLGFGSLRPLLEVAAAHGRGVFVLAATSNPEGAAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
/product="pyrf"
/protein_id="CAB02190.1"
/db_xref="GI:1542893"
                                                                                                                                                                                                  SVSVCNAVEFSVHGSQHVAMAAQGVEELGRSGVGVAESGASYAARDALAAASYLSGGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               activesite"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QNAAADGRSVAQLVVDQVGAANEAAGPGPGSIGVVVGATAPQAPDLSAFTGPVLVPGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5'-phosphate decarboxylase active site"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="possible RBS, GGGGG, 703. .1527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Mycobacterium
/strain="H37Rv"
/db_xref="taxon:1773"
/cione="Y2B12"
                                                                                                                                                                                                                                                                             /protein_id="CAB02191.1"
/db_xref="GI:1542894"
                                                                                                                                                                                                                                                                                                                           /product="PE"
                                                                                                                                                                                                                                                                                                                                                     /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="pyrF"
/note="PS00156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /db_xref="SWISS-PROT:P77898"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="taxon:1773"
/clone="Y21B4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                         /db_xref="SPTREMBL:P71656"
| translation="MTLRVVPESLAGASAAIEAVTARLAAAHAAAAPFIAAVIPPGSD
                                                                                                                                                                                                                                                                                                                                                                                                    (100 aa) (36.2% identityin69 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .39150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           . 693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "pyrF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (MTCY21B4.02), pyrF, len: 274. orotidine ecarboxylase, identical to M. bovis, 10 (274 aa); contains PS00156 Orotidine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Orotidine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RBS, GGAG,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5'-phosphate decarboxylase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tuberculosis"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for Rv1386"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for Rv1385'
  many e.g.
n cy251.15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                            RBS
                                                                                                  misc_feature
                                                                                                                                                                          misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            misc_teature
  /note="possible RBS, AGGAG, for Rv1390"
```

```
/gene="gmk"
4659. .5285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="Rv1388, (MTCY21B4.05), len: 190. Almost identical to, but longer than M. smegmatis TR:P96802 (EMBL:U75344) integration host factor (miHF) for mycobacteriophage L5 (105 aa), fasta scores; E(): 0, 96.1% identity in 102 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="14659..."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv1389, (MTCY21B4.06), gmk, len: 208, Probable guanylate kinase, similar to e.g. KGUA_ECOLI P24334 guanylate kinase (207 aa) fasta scores, opt: 424, E(): 6.6e-20, (35.9%identity in 184 aa overlap); contains PS00017 ATP/GTP-binding site motif A (P-loop), PS00856
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVSAGRIYWDPVNGTLNGLDYDDYVYPGHAIWWLARGLEFFQDGEQFGELLFTNPTGA
FQFLLYVVVVDLPTHIAQIATWLGQYPQLLSAALTGVIAHLGAITGLAGLSGLSAIPS
AAIPAVVPELTPVAAAPPMLAVAGVGPAVAAPGMLPASAPAAAAAGATAAGPTPPAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Translation="MTEPWIAPPPEVHSAMLNYGAGVGPMLISATQNGELSAQYAEAA SVEEBLLGVVASEGWGGQAEAFAFVAATWEFLAWLLGASADCVEMAAQQHVVIENTASTYS VELWEELLGVVASEGWGGQAEAFAFVAATWEFLAWLLGASADCVEMAAQQHVVIENTASTYS RSALSAMPHTSPPPLIIKSDELLPDTGEDSDEDGHNHGGHSHGGHARMIDNFFAEILR
                                                           /gene="gmk"
/note="PS00017 ATP/GTP-binding
4821. 4874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4649
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MLGNTIHVPCQPCRHGHGAPSRGLRGRPADRWPVARATPTLHVC PQNQGVGLDFVRKPEYGRLRWPAYAGTNNDRLISMRDGGIVALPQLTDEQRAAALEK AAAARRARAELKDRLKRGGTNLTQVLKDAESDEVLGKMKVSALLEALPKVGKVKAQEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               surface proteins 'anchoring' hexapeptide; similar also to
MTCY274.23c (37.5%identity in 168 aa overlap)"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Guanylate kinase signature"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="mIHF"
3952. .4524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3952.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2573.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TLAGDDFGGGPTMPMMPGTWTHDQGVFDEHR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GFGGFPPYLVGGGGPGTGFGSGQSAHAKAAASDSAAAESAAQASARAQARAARRGRSA
                                                                                                                                                                                                             /db_xref="SWISS-prOT:P71659"
/translation="MSVGEGPDTKPTARQDPAAVGRVVVLSGPSAVGKSTVVRCLRER
IPMLHESVSATTRAPREGVUGVDVLHFIDPTRFQQLIDQGELLEWAEIHGGLHRSGTL
AQPVRAAAATGVPVLIEVDLAGARAIKKTMPEAVTVFLAPPSWQDLQARLIGRGTETA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /protein_id="CAB02193.1"
/db_xref="GI:1542896"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <u>AKARGHRDEFVTMDMGFDAAAPAPEHQPGARASDCGAGPIGFAGTVRKEAVVKAAGLT</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (463 aa), fasta scores; E(): 4.2e-26, 37.7% identity 531 aa overlap; contains PS00343 Gram positive cocci
/note="PS00856 Guanylate kinase signature
                               /gene="gmk"
                                                                                                                                                                                   DVIQRRLDTARIELAAQGDFDKVVVNRRLESACAELVSLLVGTAPGSP"
                                                                                                                                                                                                                                                                                                                                     /protein_id="CAB02172.1"
/db_xref="GI:1542897"
                                                                                                                                                                                                                                                                                                                                                                                                 /transl_table=11
/product="gmk"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4659. .5285
/gene="gmk"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MTELEIAPTRRLRGLGDRQRKALLEKFGSA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /transl_table=11
/product="mIHF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note="PS00343 Gram-positive anchoring' hexapeptide"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="PPE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:P71657"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /protein_id="CAB02192.1"
/db_xref="GI:1542895"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /product="PPE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="SPTREMBL:P71658"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     possible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RBS, AGGAG, for Rv1389*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cocci surface proteins
                                                                                           site
                                                                                           motif A (P-loop)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      37.7% identity
```

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                          13307
                                                                                                                                                                                                                                                                                                               13247
                                                                                                                                                                                                                                                                                                                                                                                                                               13127
                                                                                                                                                                                                                                                                                                                                                                         13187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
865 gggccgtcaccccggcccacccgccgccgttgccgaatagccccgcggctccacct
                                                                                                                                                                                                                                                                                                                                                                                                                                                           394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3
4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             94
                                             ccgtcgccgccgagcccgcctg---tgccggtgttcccgactccgccgggccccccggcg
                                                                                                                                                           acgctgtcgccggctaccgccggccgccgtcgccgatcagcttggcggccccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cc99t9cc9cc99t9ccacc99t9ccccc9tt9acgctcaacccccgccg9tgccgccgcc
                                                                                                                                                                                                                                                                                                              CCGCGGCCGTCGCCGGTGCCGGCCGGCCGTTGCCTCCTGAGCTGACGCCGGTT
                                                                                                                                                                                                                                                                                                                                                                       ccgttgccggtgaagatgccgccgtcggctccggtgccgccgttccctccggccgagccg
                                                                                                                                                                                                                                                                                                                                                                                                                               TTGCCGATGAGCCCGCCGGTACCGCCGGCACCGCCCCCCGAAGTTATTCTCCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                               TGGCCACGGATATCACCGCCGTTGCCGCCGGCACCGCCGTCGCCGATCAGCCAGGCATTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ctcctttgccgcggtgccgcgggtcgggtcgcgagaccggttccggcggtgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCTCCGCCAGCACCGCCAAGACCGTTCGGACTGGTGACGGTCCCGCCTGCCCC----CCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGCCGTTGCCACCGGCCCCGCCGGCACCACCAATTCCGCCATTGCCGTCGGGCCCCTGG
                                                                                                                                           TGCCCGCCGGTGCCGGCCGGACCCTCCGCTGCCCCACAATCCGGCGGCGCCGCCGGCACCG
                                                                                                                                                                                                   CCGGCGCCGCCGATACCCCCCGTGCCGCCGTCGCCGGACTTGCCGCCCACCGACCCCCCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCACCGGCCCGCCGGCGCCTAATTGCGCCTTGCCCGCCGTTGCCGCCGCCACCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GTGCCGCCGTTGCCAATGAGTTGCCCACCAGCGCCGCCGGCTCCACCGGCGCCGCCGCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ctgccaccggacccgccgatgccggccatttggtccgcactggaggcgccgaaccct
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGCTGTGCCCGCCGGCCCGCCGGTGCCGTGGCCAATCAGACCGGCGGACCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               680;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="Rv1390"
5351. .5683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /product="hypothetical protein
/protein_id="CAB02173.1"
/db_xref="GI:1542898"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="SWISS-PROT:P71660"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="Rv1390,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="Rv1390"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29.7%;
59.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 344.4; DB 2; Pred. No. 2.7e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MTCY21B4.07),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               426;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         len: 110.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rv1390'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 39150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               273
                                                                                                                 804
                                                                                                                                                                                                                               687
                                                                                                                                                                                                                                                         13366
                                                                                                                                                                                                                                                                                                                                           567
                                                                                                                                                                                                                                                                                                                                                                                                                                                        447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            153
                                                                                                                                           13486
                                                                                                                                                                       747
                                                                                                                                                                                                   13426
                                                                                                                                                                                                                                                                                   627
                                                                                                                                                                                                                                                                                                               13306
                                                                                                                                                                                                                                                                                                                                                                                                  507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     13126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12829
                                                                                     13546
                                                                                                                                                                                                                                                                                                                                                                      13246
                                                                                                                                                                                                                                                                                                                                                                                                                             13186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
```

밁 δÃ Ş

οy

Ş. 밁 Qy ď δÃ В δδ 맑 δÃ 밁 δÃ 밁

```
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MTV039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOURNAL
MEDLINE
REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1045
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TCGACGTTGGCGGCCTCGGCGTGCCATACGCGCCTGCCGTGCTCGTGAGGGTCTG 13884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gccgcggcggcggcctcagcgctccgcgtacgcgccagcagcagtaaaaggtttg 1160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggacgccccagcaaccagctgggtgggcgtgttcacaatgttgagcaggccctccaacggc 1104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CCGCCGGCCCGCCGGCCTGCCCGGTCCCCGGCCCCCGTCGGCCGTGGCCGATCAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ccgccggcccggcctgcccggtccccggtgcgccgttggcgcgttgccgatcagc 1044
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCACCGCCGGCCTGACCGGTGGCGCCGGACCCGCCGTTGCCGCCGTTGCCGTACAGGATC 13714
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            999ccgccggcctggccgggccccggccggccgcgcgcgttgccgtacagcagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GGGCGCCCCAGCAGCGCCATGGTCGGCGCGTTGATCGCACCCAGCAG-----CTGCTGC
                         gene designations are in brackets after the new gene numbers.

Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position Genes in the observed/expected third position Genes where possible we choose an initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream codon).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             available on the World Wide Web.

available on the World Wide Web.

(URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have been renumbered from the original cosmid submissions but the old been renumbered from the beautiful submissions but the old been renumbered from the beautiful submissions but the old been renumbered from the beautiful submissions but the old been renumbered from the beautiful submissions but the old been renumbered from the beautiful submissions but the old been renumbered from the beautiful submissions but the old been renumbered from the old beautiful submissions but the old been renumbered from the old beautiful submissions but the old been renumbered from the old beautiful submissions but the old been renumbered from the old beautiful submissions but the old been renumbered from the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions but the old beautiful submissions b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambaridge CB10 1SA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhill@sanger.ac.uk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Deciphering the biology of Mycobacterium tuberculosis complete genome sequence
Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Elglmeier, K., Gas, S., Barry III, C.E., Harris, D., Gordon, S.V., Elglmeier, K., Gas, S., Barry III, C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Details of M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     On Jun 20, 1998 this sequence version replaced gi:2909621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Erratum:[[published erratum 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacterium tuberculosis
AL021942 AL123456
AL021942.1 GI:3242298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Actinomycetales; Corynebacterineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (bases 1 to 29550)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (bases 1 to 29550)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -CCACCCAGGCCGCCGGCCCGCCGTGGCCGATCAGCCCGGCCGCCCCCGCCC 13654
codon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29550 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tuberculosis sequencing at the Sanger Centre are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                H37Rv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   appears
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          segment 29/162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      984
```

```
FEATURES
                                                                                                                                                          gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
CDS
                                                                                                                                                                                                                                                                                                                                                 RBS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="Rv0565c, (MTV039.03c), len: 486. Probable monoxygenase similar to other putative monoxygenases in Mycobacterium tuberculosis e.g. MTCY01A6.14 (489 aa), MTCY013-4 (495 aa), MTCY31.20 (495 aa) and CYCLOHEXANONE MONOOXYGENASE P12015|CYMO_ACISP (542 aa) (EC 1.14.13.22) from Acinetobacter. FASTA scores: Z83864|MTCY1A6_14 (489 aa) opt: 1571 z-score: 1903.6 E(): 0; 49.0% identity in 471 aa overlap; and splp12015|CYMO_ACISP CYCLOHEXANONE MONOOXYGENASE (542 aa) opt: 354 z-score: 429.0 E(): 2.1e-16; 23.7% identity in 435 aa overla. TBparse score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /product="ggdA1"
/product="ggdA1"
/product="ggdA1"
/protein_id="CAA17435.1"
/protein_id="CAA17435.1"
/db_xref="G1"; 2995623"
/db_xref="G1"; 2997FXBH2: O53761"
/db_xref="MAANKREPKVVVLGGGSWGTTVASICARRGPTLQWVRSAVTAQD
/trans1ation="MAANKREPKVVVLGGGSWGTTVASICARRGPTLQWVRSAVTAQD
/trans1ation="MAANKREPKVVVLGGGSWGTTVASICARRGPTLQWVRSAVTAQD
/trans1ation="MAANKREPKTREPKVVTVGTEAARCADVVVMGVPSACGVAAARVLAWP
PWVPVVSLVKGLEQGTNMRMSQIIEEVLPGHPAGIIAGVGNGYSLGIGENTRALV
IARALREMTKLGVAMGGKSETFPGLAGLGDLIVTCTSQRSRNRHVGEQLGAGKPIDEI
IASMSQVAEGVKAAGVVMEFANEFGLNMPIAREVDAVINHGSTVEQAYRGLIAEVPGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MTCr349.05 (334 aa), probable glycerol-3-phosphate dehydrogenase, and many other glycerol-3-phosphate dehydrogenase, and many other glycerol-3-phosphate dehydrogenases. Contains p800017ATP/CTP-binding site motif A (P-loop). FASTA scores:283018|MTCY349_5 (334 aa) opt: 740 z-score: 899,9 E(): 0; 40.4% identity in 322 aa overlap; and splp46519|GPDA_BACSU GLYCEROL-3-PHOSPHATE DEHYDROGENASE (345 aa) opt: 731 z-score: 888.8 E(): 0; 37.3% identity in 332 aa overlap.TBparse score is 0.891"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ASKYSTFAAVVRKALPPKTSHLIVRMYNALLEAVFWFLSRKTPVFVKWLLRRTAIKNL
PEGYDIETHFTPRYNPWDQRLCLIPDADLYNAITSGRAEVVTDHIDHFDATGIALKSG
GHLDADIIVTATGLQLQALGGAAISLDGVEIDPRDRFVYKAHMLEDVPNLFWCVGYTN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MSVTPNAGCVDVVIVGAGISGLGAAYRIIERNPQLTYTILERRA RIGGTWDLFRYPGVRSDSSIETLSFPYEDFWTREEGIAGGAHREYLTDMAHKYGLDRH IETHNSYVRADMDSSTDTWTYFEDGONGVHKHYRSFYFFSGYYNYDEGYTPDFGGIE KEGGAVVHPQHWPEDLDYTGKKIVVIGSGATAVTLIFSLTDRAEKVTMLQRSPTYLIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(1208. .2668)
/gene="Rv0565c"
complement(1208. .2668)
/gene="Rv0565c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complement (437. .460)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(122. .1147)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /note="fragment designated v039. Does not represent a physical clone" % \left( 1\right) =\left( 1\right) \left( 1
                                                                                                                                                                                                                                                                                                                                                                                                        PKSGTKRPWNVRQNYLADAIDYRFDRIEEAMVFGAA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ASWTLRADMTARATAKLLAHMAAHGHTRAAPHLGDEPMDEKPSWDIQAGYVKRAPYAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /product="hypothetical protein Rv0565c"
/protein_id="CAA17436.1"
/db_xref="GI:2009624"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EVHGSGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    dehydrogenase similar to Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(122. .1147)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /organism="Mycobacterium tuberculosis"
/strain="H37Rv"
/db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                          /note="possible RBS, gagg, for Rv0565c'
complement(2746. .3237)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      is 0.902"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="gpdA1"
/note="PS00017 ATP/GTP-binding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gene="gpdA1"
/note="Rv0564c, (MTV039.02c), len: 341.gpdA1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /db_xref="SPTREMBL:053762"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="gpdA1"
                                                                                                                                                                                                                                                                                                                               2678)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         site motif A (P-loop)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Probable
```

CDS

gene

```
/uote="RY0566c, (MTY039.04c), len: 163. Unknown but similar to B.subtilis Yitk (163 aa) and E. coli, H. influenzae e.g. splp774821YAJQ_ECOLI (169 aa). FASTA scores: Y094761BXY09476_42 (163 aa) opt: 435 z-score: 508.6 E(): 7.9e-21;45.1% identity in 162 aa overlap; and splp774821YAJQ_ECOLIHYPOTHETICAL 19.0 KD (169 aa) opt: 422 z-score: 493.7 E(): 5.4e-20; 44.1% identity in 161 aa overlap. TBparse score is0.844"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
/transl_table=11
/product="hypothetical prote
/protein_id="CAA17438.1"
/db_xref="G1:2909626"
/db_xref="SPTREMBL:053764"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /gene="Rv0567"
3519. .4538
/gene="Rv0567"
                                                                                                                                                                                            /note="Rv0568, (MTv039.06), len: 472. Unknown but similar roputative Mycobacterium tuberculosis cytochrome P-450 monoxygenase, MTcv33.3c (449 aa), and other cytochrome P-450 related enzymes e.g. P29980|CPNN_ANASP (459 aa). Contains cytochrome P450 cysteine heme-iron ligand signature (PS00086). FASTA scores: Z9680|MTCv53_32 (449 aa) opt: 1080 z-score: 1266.4E(): 0, 40.5% identity in 44 aa overlap; and sp|Pz9980|CPNN_ANASP PROBABLE CYTOCHROME P450 (459 aa) opt: 525 z-score: 617.0 E(): 7.2e-7; 31.9% identity in 417 aa overla. TBparse score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="RV0567, (MTV039.05), len: 339. Probable methyltransferase similar to several e.g. TETRACENOMYCIN POLYKETIDE SYNTHESIS 8-O-METHYL TRANSFERASE SP|P39896|TCMO_STRGA (339 aa). FASTA SCOTES: SP|P39896|TCMO_STRGA (339 aa) opt: 685 z-score: 836.6 E(): 0, 35.8% identity in 335 aa overlap; and SP|P10950|HIOM_BOVIN HYDROXYINDLE O-METHYLTRANSFERASE(345 aa) opt: 509 z-score: 622.8 E(): 3.4e-27; 30.7% identity in 332 aa overlap. TBparse score is 0.910"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   aagga,
3519.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3307. .3387
/note="tyrT, tRNA-Tyr : anticodon gta"
3507. .3511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /gene="Rv0568"
4648. .6066
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="possible RBS, aaggagg,
3307. .3387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complement (3248.
/transl_table=11
/transl_table=11
/product="hypothetical protein
/protein_id="cah17439.1"
/db_xref="GI:2909627"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4648.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TLIDDARRENTTGLMMSLNMLIEFGDAFDYSAADFRGWCGEAGFRSFEVIPLAGGSSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ELLAKRFPFERYRRLCDVGCADGLLSRIVAAAHPHLQCVSFDLPAVTEIARRKLTAEG
LGERVQACAGDFLADPLPAADVITMGQILHDWNLDRKQQLVAKAYEALSKEGAFIVIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DRLGLLKRPAIDFLDALVSLDLLARDGDGPGSHYRNTPETAHFLDEARPTYAGGLLKI
WNERNYRFWADLTEALKTGKAQSEVKQTGRPFFEALYADPRRLEAFMAAMDAASRRNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note="possible RBS, ggagg, for Rv0567; possible RBS,
aagga, for Rv0569"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SSENAKKITKLIRDAGPKNVKTQIQGDEVRVTSKKRDDLQAVIAMLKKADLDVALQFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /translation="mADSSFDIVSKVDRQEVDNALNQAAKELATRFDFRGTDTKIAWK
GDEAVELTSSTEERVKAAVDVFKEKLIRRDISLKAFEAGEPQASGKTYKVTGALKQGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product="hypothetical protein Rv0566c"
/protein_id="CAA17437.1"
/db_xref="GI:2909625"
                                                                                                                                  /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /gene="Rv0568"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /translation="MELSPDRIMAIGGGYGPSKVLLTAVGLGLFTELGDEAMTAEAIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:053763"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .3254)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 protein Rv0567"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for Rv0566c*
```

gene CDS RBS TRNA

/translation="MSGTSSMGLPPGPRLSGSVQAVLMLRHGLRFLTACQRRYGSVFTLYVAGFGHWYLSDPAAIKTVFAGNPSVFHAGEANSMLAGLLGDSSLLLIDDDVHRDRRRLMSPPFHRDAVARQAGPIAEIAAANIAGWPWAKAFAVAPKMSEITLEVILRTVIGA

```
γQ
                                                                           БР
                                                                                                  Ş
, 0
                            B
                                                                                                                           Вb
                                                                                                                                                ρ
                                                                                                                                                                           В
                                                                                                                                                                                                ğ
                                                                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                              Q
                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20071
                                                                                                                                                                            20470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19771
                                                                                                                                                                                                                           20410
                                                                                                                                                                                                                                                                                                                         20311
                                                                                                                                                                                                                                                                                                                                                                        20251
                                                                                                                                                                                                                                                                                                                                                                                                                       20191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19951
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19891
                                                                                                    849
                                                                                                                                                    789
                                                                                                                                                                                                   729
                                                                                                                                                                                                                                                   669
                                                                                                                                                                                                                                                                                                                                                549
                                                                                                                                                                                                                                                                                                 609
                                                                                                                                                                                                                                                                                                                                                                                                489
                                                                                                                                                                                                                                                                                                                                                                                                                                               429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         69
     gttgccgtacagcccgccggcccggcttgcccggtccccggtgcgccgttggc
                                                                           GGCCCCGCCGGTG----GTACCCACGCCGCCGCCCGCTTGCCGCCGTTACCGATTAG
                                            agccgcgccgttgcccgggccgtcacccccggccccacccgccgccgcttgccgaatag
                                                                                                                                         ggcccggcggcgcaccgttgaagcctggcccggccggcccgccgatgccaccggctcc
                                                                                                                                                                                                                                                                                         cccgccggtgccgccggcaccgccggccgaccacctcgaacagcccgctgcgaccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                     geeggtgeeggteeeggttgeeggtgaagatgeegeegtegeeteeggtgeegee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gccgagaccggttccggcggtgccgccaatgccgccagcgccgaagaggatgccggcgtt 368
                                                                                                                            GAACAACCCGGCGGTACCGCCGGCCGCCGTTGCC----
                                                                                                                                                                                                                          CGACGTACCCGTGACACCGGCGATGCCGTTGCCTCCGGCCCCACCGGCCCGGCCGACACC
                                                                                                                                                                                                                                                                         CCCGCCGGCCCAGCGGTGCCGGATCCACCCGGTGTG-----
                                                                                                                                                                                                                                                                                                                         G-----CCGTTGCCCATCAGCACCCCGCCGGCCCGCCGGCCCGCCGTTGCCGCCGAT
                                                                                                                                                                                                                                                                                                                                      gaacagcccgccgccccccgccggtgcccggtgccccggtgcccccgttgacgctcaa
                                                                                                                                                                                                                                                                                                                                                                                     ACCATTCCCGCCGTTTCCGCCGGCTTGACCGTCAGCGCCCAAGTTGGTGGCGTGGGCCCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gecgecegecegeeggeeeteacegeecaegagttggttageggtgeeagttee
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ACCGGTCCCGCCGGCACCAAGGTTGTGACCCCCACGTCCCGGTAGCGCCGTTGCCGCCGTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gccgccgctaccggccgcgccggacgctgtcgccgccggtaccgccggcggcgccgtc 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCCGCGGCCACCGGCACCGGCACCGCCATTACCCACCTGACCGCCGTCGCCACCCCT 19830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9ccagtcccgccggcgccaccagcgccgccgtcaccgatcaaccgccggtcgccgccggt
                                                                                                                                                                                                                                                                                                                                                                       gccggcaccgccgatgccgccgacgcctcctttgccgccggtgccgccggggtcgggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCCGACGCTGGCGCCACCGGCCACCGGCCCCACCGGGCCCGGGTTGCCGCCATTGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gccgatcagcttggcggccccgccgctgccaccggacccgccgatgccgccggccatttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GCCACCGTTCGCGGCCGGTCTGTCCGCTGCTGATAGCGTCGGCGCCCTTTGCCGCCGTCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 343.6; DE Pred. No. 3.6e-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches 429;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                         -----CTGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29550
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                    968
                                                                                                    908
                                                                                                                                                   848
                                                                                                                                                                                                                                                                                                 668
                                                                                                                                                                                                                                                                                                                                               809
                            20700
                                                                            20640
                                                                                                                            20583
                                                                                                                                                                                                   788
                                                                                                                                                                                                                                                728
                                                                                                                                                                                                                                                                         20409
                                                                                                                                                                                                                                                                                                                        2036
                                                                                                                                                                                                                                                                                                                                                                       20310
                                                                                                                                                                                                                                                                                                                                                                                               548
                                                                                                                                                                                                                                                                                                                                                                                                                     20250
                                                                                                                                                                                                                                                                                                                                                                                                                                            488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      68
                                                                                                                                                                           20523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   20070
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
```

```
REFERENCE
AUTHORS
TITLE
                                                                                           FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACCESSION
VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT
MTV017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20875
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                agtaaaggtttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTTGCCGTACAAGATGCCGCCTGGCCCGCCGCCGCCGCTCCCGGGGGGAGCCGTCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GGACAGGGTCTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             caggccctccaacggcgccgcggcggcggcctcagcgctcgcgtacgcgccagcgcccgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    been renumbered from the original cosmid submissions but the old gene designations are in brackets after the new gene numbers. Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream ribosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Direct Submission
Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams, Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 ISA Unite de Genetique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhillesanger.ac.uk
On Jun 26, 1998 this sequence version replaced gi:2896684.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C.E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Rutter, S., Seeger, R., Skelton, S., Rutter, 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.
(URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Parkhill, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Bacteria; Pirmicutes; Actinobacteria; Actinobacteridae;
Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Erratum:([published erratum appears
12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complete genome sequence
Nature 393 (6685), 537-544 (1998)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Barrell, B.G.
Deciphering the biology of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AL021897 AL123456
AL021897.1 GI:3256022
                                                                                                                                    initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Notes:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    98295987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Squares, S., Sqares, R., Sulston, J.E., Taylor, K., Whitehead, S. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mycobacterium; Mycobacterium tuberculosis 1 (bases 1 to 67200)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (bases 1 to 67200)
/organism="Mycobacterium
                                                                                  Location/Qualifiers
                                             .67200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             67200 bp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         H37Rv complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         segment 48/162.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1088
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             20760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20820
```

tuberculosis'

RBS	gene CDS	CDS	RBS	misc_feature RBS gene CDS
possible helix-turn-helix motif at aa197-218 (Score 1097, +2.92 SD)" /codon_start=1 /trans1_table=11 /product="hypothetical protein Rv1051c" /protein_id="cAA17167.1" /protein_id="cAA17167.1" /db_xref="GI:2896688" /db_xref="GI:2896688" /db_xref="GI:2896688" /db_xref="SPTERMBL:053399" /translation="MRADVTAEHLTQVVRDIAVIDIDDGVAFNLDTSSVQEIRERADV PGLRVRVAMSVGPWQGIAAWDVSTGEPIAPWPTRVTIDRILGEPITLLGYAPETITAE KGVTILERGITSTRWRDYVDIVQLDRRGIDDDELLRSARAVAQYRGATLEPVAPHLAG YGAVAQAKWATEHGRCQHCWRHWKPAHVGRRWDLLDAKQVSEMIGVPVGTLRHWRHS DIGPASFTLGRRVVYRRDEVSRWISKRESATER" 35073513 /note="possible RBS, aaggtgg, for Rv1052"	/translation="MARQREDQVVLTTGASSGIGEATAKAFAREGAVVALAARREGA /translation="MARQREDQVVLTTGASSGIGEATAKAFAREGAVVALAARREGA /translation="MARQREDQVVLTTGASSGISVAMVADVVGENGRIDVVFNNAGVSIJVGPVD AETFLDDTREMLEIDYLGTVRVVREVLPIMKOQNSGRIMNMSSVVGRKAFARFAGYSS AMHAIAGFSDALKOGLRGSGIAVSVIHPALTQTPLLANVDPADMPPPFRSLTPIPVHW VAAAVLDGVARRRARVVVPEQPRLLMVGDAFSPRYGDRVVRLLESKIFGRLIGSYRGS VVRHQPTESAKAQAAQPERGYSSAR" complement(17432498) /gene="Rv1051c" complement(17432498) /gene="Rv1051c" /note="Rv1051c" /note="Rv1051c" /10te="Rv1051c" /10te="Rv105	/gene="Rv1050" 679184 /gene="Rv1050" /gene="Rv1050" /note="Rv1050, (MTV017.03), len: 301. Probable /note="Rv1050, (MTV017.03), len: 301. Probable /note="Rv1050, (MTV017.03), len: 301. Probable /note="Rv1050, (MTV017.03), len: 301. Probable /note="Rv1050, (MTV017.03), len: 301. Probable /vide="Rv1050, (MTV017.03), len: 301. Probable /rv1050** /vide="Rv1050" /product="Supendin: 1265 aa overlap. TBparse score is 0.896" /product="hypothetical protein Rv1050" /protein_id="CAA17166.1" /protein_id="CAA17166.1" /db_xref="Supendin: 123308"	helix-turn-helix motif at aa 58-79 (Score 1495, +4.28 SD)" /codon_start=1 /trans1_table=11 /trans1_table=11 /product="hypothetical protein Rv1049" /protein_id="caa17155.1" /protein_id="caa17155.1" /db_xref="STTREMBL:053397" /translation="MGKGAAFDECACYTTRRAARQLGQAYDRALRPSGLTNTOFSTLA VISLSEGSAGIDLTMSELAARIGVERTTLTRNLEVMRRDGLVRVMAGADARCKRIELT AKGRAALQKAVPLWRGVQAEVTASVGDWPRVRRDIANLGQAAEACR" 668672 /note="possible RBS, aggag, for Rv1050"	/db_xref="taxon:1773" <166170 /note="fragment designated v017. Does not represent a physical clone" 178181 /note="possible RBS, ggag, for Rv1049" 184630 /gene="Rv1049" 184630 /gene="Rv1049" /note="Rv1049" /note="Rv10
trna	gene CDS	CDS	gene CDS	gene
L39//IMSCINT_1 (191 aa)and to many other integrases or transposases. FASTASCORES: T970702 MTCT3G12_25 (151 aa) opt: 291 z-score:428.6 E():2.2e-15; 74.3% identity in 70 aa overlap; andsp L39071 MSGINT_1 (191 aa) opt: 146 z-score: 221.0 E(): 8.3e-05; 52.1% identity in 48 aa overlap; (codon_start=1 /crans1_table=11 /product="hypothetical protein Rv1055" /protein_id="cAA17171.1" /protein_id="cAA17171.1" /db_xref="gi:2896692" /db_xref="SPTREMBL:053403" /translation="MYPHGLGHTTASLAISAGANVKVVQRLLGHAAAAMTLDRHGHLL NDDLAVWPMRCAKSSRTLRYHCGMRRRNRVGLRA" 51945267	/translatiable=11 /product="hypothetical protein Rv1054" /product="hypothetical protein Rv1054" /protein_id="cAA17170.1" /db_xref="Sp12896691" /db_xref="SpTREMBL:053402" /translation="MTGKGIVESTTKTKRDRHVPVPEPVWRRLHAELPTDPNALVFPG /KGGFLPLGEYRWAFDNAGDQVGIE" /4935. 5171 /gene="Rv1055" /4935. 5171 /gene="Rv1055" /4935. 5171 /gene="Rv1055" /4935. 5171 /gene="Rv1055" /fote="Rv1055" /f	າ ⊢∞ທ່∃ຫ້ວີລີ ແ	Complement(38094084) /gene="Rv1053c" /gene="Rv1053c" /note="Rv1053c, (MTV017.06c), len: 91. Unknown" /codon_start=1 /trans1_table=11 /product="hypothetical protein Rv1053c" /product="hypothetical protein Rv1053c" /product="G1:2896690" /db_xref="G1:2896690" /trans1ation="MDSHKVCMNNNTQLPTGPIIGVHPAVRDGVERVAYLDGDLLRCN TDVEFTSSPPGEPVLYRTKHTRVEIADEMVTEKLIKRQRAFNSRRHQ" 47264932	# III O III O II 77

```
19192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19078
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18958
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18601
      1048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19018
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     18781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cgccccagcaacagctgggtggtgttcacaatgttgagcaggccctccaacggcgcc
                                                                                                                                                                                                                                  | 108 | 108 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 | 109 
                                                                                                       ceggccccgccggcttgcccggtccccggtgcgcttgccggttgccgatcagcgga 1047
                                                                                                                                                                                                 CCGGTGAGCCCGGCGGTGGTTTGGGAAAACCCGTTGCCGCTTGCCGTACAACAACCCA 1955;
                                                                                                                                                                                                                                                                                                                         GCTCCGCCGGCCCTCCGTTGCCGCCGTTGCCGATCAACCCGGCCGACCCGCCGGTACCC
                                                                                                                                                                                                                                                                                                                                                                    tcacccccggcccacccgccgccgttgccgaatagccccgcgggctccacctgggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gagccgaacagcagcccggcccggcccggccagccgcgttgcccgggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GCACCACCGCGACGCCCGGCGCGCGATGGCTCCGGCGGGGGCCGGCGCCGGCGCCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              togcogcogagcocgcotgtgcoggtgttcccgactccgccgggcccccccggcgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CCGCCGGCACCGCCGCCGCCGTTGCCGAACAATCCGGCCGTTCCCCCGGCCCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TTGCCGGACAGCCGGCCGACCCGCCGTCGCCACCGCGGCCGCCGGCGCCGCCGCT 1925;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccgccggtgccaccggtgcccccgttgacgctcaacccgccggtgccgccgccggcaccgcc-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GCGGTGCCGCCGCCGCCGGTGCCGCCGTTGCCCGACAGCCAG------CCGGCTGAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tggttagcggtgccagttccgcggtgccggcggttcccgccggttgccggtgaagatgccg 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GCACCGCCCG - - - CGTGGCCGTTGCCACCGTTGCCGGCGGTGCCGCCGCCGAAGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGCCGGTGCCGCCTGCCTCCGCTGCCGAGCAGGCCGGCGGTGCCGCCGCTACCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ccgccgggaccgaacagtgcgccggccgacgccgatgccgccgacgcctcctttgccgccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CCGTTGCCGCTTGCCTTTGGCGCCCGCTGCCGGCGCCCAGACCGCCGTTGCCGCCGTCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TTGCCGCCGTTACCGCTTACCGATCAACTGGGCGTCGCCGCCCTTGCCGCCGTCGCCA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gtaccgccggcgccgccgccgatcagcttggcggccccgcgctgccaccggacccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCGCCGGCCCTCCAGTGCCGTTGATTCCGGGCATCAGGCCGGTGCCGCCTTTGCCACCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCATTGCCGCCGCTGCCGTAGAGCCAGCCGCCGTTGCCGCCGCCGCCGCCGTTGGCGCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCACCGCCGGTGCCGGTGCTGCCCATCCCACCGGCGCCGCCGGCGCCGCCGTCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  697;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             29.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----teeggtgeegeegtteeeteeggeegageeggagaet 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 341; DB 2; Pred. No. 3.1e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 67200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                           930
                                                                     19608
                                                                                                                                                                                                                                                                                                                            19491
                                                                                                                                                                                                                                                                                                                                                                                                                                                           19431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       870
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              810
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                750
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        19191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   19131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 19077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19371
                                                                                                                                                                                                                                                                                                                                                             FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT
MTCY270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AUTHORS
TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JOURNAL MEDLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REMARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AUTHORS
                                                                                                CDS
                                                                                                                                                                                                                                                                                                                            source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Parkhill,J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complete genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mycobacterium.
                                                                                                                                                                                                                                                                                                                                                                                           initiation codon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     37586
```

δÃ

оу оу оу ор 04 pp

δδ δ δ

밁

DЪ

 Š

밁

оу Оу Оу Оу

```
19663 ACGTTGGTCGCCTCGGCGCTGGCATACGCGCCCCGCACTTGACGTCAGGG 19711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gcggcggcctcagcgctcgcgtacgcgccagcgcccgcagtaaagg 1156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CGCCCCAACAGCGCCTGGGTGGGCGCGTTGATCAAACCCAGCA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Submitted (11-JUN-1998) Submitted on behalf of the Mycobacterium tuberculosis sequencing and mapping teams. Sanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CBIO 15A Unite de Genocique Moleculaire Bacterienne, Institut Pasteur, 28 rue du Docteur Roux, 75724 Paris Cedex 15, France E-mail: parkhil@sanger.ac.uk On Jun 27, 1998 this sequence version replaced gi:2104310.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cole, S.T., Brosch, R., Parkhill, J., Garnier, T., Churcher, C., Harris, D., Gordon, S.V., Eiglmeier, K., Gas, S., Barry III, C. E., Tekaia, F., Badcock, K., Basham, D., Brown, D., Chillingworth, T., Connor, R., Davies, R., Devlin, K., Feltwell, T., Gentles, S., Hamlin, N., Holroyd, S., Hornsby, T., Jagels, K., Krogh, A., McLean, J., Moule, S., Murphy, L., Oliver, S., Osborne, J., Quail, N.A., Rajandream, M.A., Rogers, J., Rutter, S., Seeger, K., Skelton, S., Squares, S., Squares, R., Sulston, J.E., Taylor, K., Whitehead, S. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gene prediction was based on a Hidden Markov Model of TB genes implemented in TBparse (Krogh) supplemented with visual inspection of positional base preference in codons, especially where there is an increase in the observed/expected third position G + C. CAUTION: In some cases we may not have predicted the correct course.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mycobacterium tuberculosis.
Mycobacterium tuberculosis
Mycobacterium tuberculosis
Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
Bacteria; Corvnebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            initiation codon. Where possible we choose an initiation codon (atg, gtg, or ttg) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon) if this cannot be identified we choose the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mycobacterium tuberculosis
Z95388 AL123456
Z95388.1 GI:3261759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              been renumbered from the original cosmid submissions but the gene designations are in brackets after the new gene numbers.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Details of M. tuberculosis sequencing at the Sanger Centre are available on the World Wide Web.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Squares, S., Squres, R., Sulston, J.E., Barrell, B.G.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (URL, http://www.sanger.ac.uk/Projects/M_tuberculosis/) CDS have
been renumbered from the original cosmid submissions but the old
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Erratum:[[published erratum appears 12;396(6707):190]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Deciphering the biology of Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (bases 1 to 37586)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (bases 1 to 37586)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   te genome sequence
393 (6685), 537-544 (1998)
   /note="Rv2131c,
to M. leprae CY
                                                                                                                 complement(51.
                                                                                                                                                                              complement(51.
                                                                        /gene="cyso"
                                                                                                                                      /gene="cysQ"
                                                                                                                                                                                                                   /db_xref="taxon:1773"
/clone="Y270"
                                                                                                                                                                                                                                                                                        /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                         /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
   leprae CYSQ_MYCLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  dq
                                                                                                                 . 854)
                                           (MTCY270.37),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             H37Rv complete
0.37), len: 267. cysQ, equivalent P46726 cysq protein homolog. (289
                                                                                                                                                                                                                                                                                                                             tuberculosis'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             genome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -CCTGCTGTTCG 19662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the most upstream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10-FEB-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96/162.
```

opt:

```
misc_feature
                        /translation="MARAIHVERTEDREVAGTVGQPGNRTFYLQAVHDSRVVSVVLEK
QQVAVLAERIGALLEEVNRREGTPVPPEPTEIDDLSPLIMPVDAEERVGTMGLGMDSE
AQSVVVELLAVTDAEEDASVVLDDTEEGPDAVRVFLTPESARQEATRSYRVISAGRPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /db_xref="Sptrembl:006242"
/translation="MLADGELTVLGRIRSASNATFLCESTLGLRSLHCVYKPVSGERP
LWDFPDGTLAGRELSAVLVSTOLGWNLVPHTIIRDGPAGIGMLQLWVQQPGDAVDSDR
LPGPDLVDLFPAHRPRPGYLPVLRAVDYAGDEVVLMHADDIRLRRMAVFDVLINNADR
KGGHILCGIDGQVYGVDHGLCLHVENKLRTVLWGWAGKPIDDQILQAVAGLADALGGP
LAEALAGRIAAAGIGALRRRAQSLLDQPVMPGPNGHRPIPWPAF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(1385. .2173)

/gene="Rv2133c"
/gene="Rv2133c"
/note="Rv2133c, (MTCY270.35), len: 262. Function: unknown but equivalent to hypothetical M. leprae protein, Q49774.

FASTA best: Q49774 B2126_C1_150. (262 aa) opt: 1447

C-score:1647.5 E(): 0; (79.0% identity in 262 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /db_xref="SPTREMBL:006243"
/translation="MRTTVSLADDVAAAVQRLRKERSIGLSEAVNELIRAGLTKRQVA
NRFQQQTYDMGEGIDYSNIGDAIETLDGPASG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         but some similarity to Mycobacterium tuberculosis protein AL021924|MTV020_4 (84 aa). FASTA score: opt: 142 z-score: 210.0 E(): 0.00036; 41.8% identity in 55 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           945
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="MVSPAAPDLTDDLTDAELAADLAADAGKLLLQVRAEIGFDQPWT LGEAGDRQANSLLLRRLQAERPGDAVLSEEAHDDLARLKSDRWMIIDPLDGTREESTP GRDDMAVHLAHRRSSNGOPEITDAAAVALPARGNVVYRTDTVTSGAAPAGVPGTLLIA VSATRPPAVLHRIQOTLAIQPYSIGSAGAKAMAVIDGYVDAYLHAGGQWEWDSAAPAG VMLAAGMHASRLDGSPLRYNQLDPYLPDLLMCRAEVAPILLGAIADAWR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           aa). Contains inositol monophosphatase family signature 1 (PS00629), significance uncertain. FASTA best: CYSQ_MYCLE P46726 cysq protein homolog. (289 aa) opt: 1374 z-score: 1597.0E(): 0; (77.3% identity in 264 aa overlap)
   CPLCDEPLDPEGHICARTNGYRRDVLLGSGDDPAG"
                                                                                                                                                                                                                                                                                  /note="Rv2134c, (MTCY270.34), len: 195. Function: unbut equivalent to hypothetical M. leprae protein, QuFASTA best: Q49789 B2126. C3_228, opt: 1192 z-score: E(): 0 (91.1% identity in 192 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                      complement(2184. .2771)
/gene="Rv2134c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                               complement(2184. .2771)
/gene="Rv2134c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         complement(1385. .2173)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /gene="Rv2132"
945. .1175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement (552.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /transl_table=11
/product="cysQ"
/protein_id="CAB08639.1"
/db_xref="GI:2104347"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="hypothetical protein
/protein_id="CAB08660.1"
/db_xref="GI:2104345"
/db_xref="GI:2104345"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /product="hypothetical
/protein_id="CAB08638.1
/db_xref="GI:2104346"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                945. .1175
/gene="Rv2132"
                                                                                                                                                                    /product="hypothetical
/protein_id="CAB08659.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /codon_start=1
/transl_table=11
                                                                                                                /db_xref="SPTREMBL:006241"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv2133c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     note="Rv2132,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="cysQ"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /db_xref="SPTREMBL:006244"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /codon_start=1
                                                                                                                                                  'db_xref="GI:2104344"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               note="PS00629 Inositol monophosphatase"
                                                                                                                                                                                                                                 _table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MTCY270.36c), len: 76. Function unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               . 593)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ar protein
                                                                                                                                                                       ı protein Rv2134c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rv2133c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rv2132'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               family signature
                                                                                                                                                                                                                                                                                                                      , Q49789.
ce: 1493.1
                                                      δÃ
Ъ
                                                                                                                Matches
                                                                                                                                            Query Match
Best Local
   30955
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CDS
                           4 tcgatgccagtcccgccggcgccaccagcgccgccgttcaccgatcaacccgccggtgccg 63;
TCGCCGCCTTCCCCGCCGTTGCCGCCGCCGCCGTCACCGATCAGCCTGGCGTTGCCG 31014
                                                                                                                al Similarity
737; Conser
                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="Rv2136c, (MTCv270.32), len: 276. Function: unknown possible membrane protein very similar to hypothetical M. leprae protein 049783. FASTA best: 049783 B2126 C2190. opt:1023 z-score: 1259.2 E(): 0; (82.4% identity in 187 acoverlap) similar to BACA_ECOLI p31054 bacitracin resistance protein (273 aa) opt: 477 z-score: 590.1 E(): 7e-26, (35.6% identity in 267 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                            /note="Rv2137c, (MTCY270.31), len: 137. Function: unknown C-terminus is very similar to hypothetical M. Leprae protein B2126_C2_188 (150 aa), FASTA best: Q49782 B2126_C2_188. (150 aa) opt: 469 z-score: 623.7 E(): 9.6e-28; (77.2% identity in 101 aa overlap)"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(4436. .4849)
/gene="Rv2137c"
complement(4436. .4849)
/gene="Rv2137c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(2835. .3545)
/gene="Rv2135c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(3542. .4372)
/gene="Rv2136c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in C-terminus to PMG2_ECOLI P36942 probable
phosphoglycerate mutase 2 (215 aa) fasta scores;
z-score: 257.4 E():2.5e-07 27.9% identity in 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="Rv2135c, (MTCY270.33), len: 236. Function: unknown but equivalent to hypothetical M. leprae protein, Q49773. FASTA best: Q49773 B2126_C1_148 opt: 1183 z-score: 1390.9 E(): 0; (74.8% identity in 250 aa overlap), also similar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(2835. .3545)
/gene="Rv2135c"
                                                                                                                                                                                                                           /db_xref="SPTREMBL:006238"
/translation="mrnmkSTSHESESGKLLSISSCRPREMVLQRYSLGMTVTADRHL
ADKREEFAVEDISTGIFASGYGQVGDGRSFSFHIEHRSLVVEIYRPRVAGPVPQAEDV
                                                                                                                                                                                                                                                                                                                /product="hypothetical
/protein_id="CAB08656.]
/db_xref="GI:2104341"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LVPGVSRSGSTISAGLFLGLDRELAARFGFLLAIPAVFASGLFSLPDAFHPVTEGMSA
TGPQLLVATLIAFVLGLTAVAWLLRFLVRHNMYWFVGYRVLVGTGMLVLLATGTVAAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FFKDDIRSGVRNLWVVVTALVVFSGVIALAEYVGRQSRHIERLTWRDAVVVGIAQTLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /translation="MSWWQVIVLAAAQGLTEFLPVSSSGHLAIVSRIFFSGDAGASFT
AVSQLGTEAAVVIYFARDIVRILSAWLHGLVVKAHRNTDYRLGWYVIIGTIPICILGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /transl_table=11
/product="hypothetical
/protein_id="CABO8657.]
/db_xref="GI:2104342"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(3542. .4372)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADAFGMHLDSFORITADPGSVSVVRYTOLRPFVLHVNHTGARLAPALQAAASAQGASP
EPNAAVPPGDAVIGGSTD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LPIRAVASSPMLRCQRTVEPLAEALCLEPLIDDRFSEVDYGEWTGRKIGDLVDEPLWR
VVQAHPSAAVFPGGEGLAQVQTRAVAAVREHDRRLADQHGHDVLWLACTHGDVIKAVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /product-"hypothetical protein Rv2135c"
/product-"hypothetical protein Rv2135c"
/protein id-"CAB08658.1"
/db_xref-"GI:2104343"
/db_xref-"GI:2104343"
/db_xref-"SFTREMBL:006240"
/translation="MTVILLRHARSTSNTAGVLAGRSGVDLDEKGREQATGLIDRIGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /gene="Rv2136c"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     transl_table=11/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                      /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /db_xref="SPTREMBL:006239"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="possible RBS,
                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start=1
                                                                                                                                         29.3%;
61.7%;
                                                                                                             Score 340.6; DB 2
Pred. No. 4.8e-15;
D; Mismatches 404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    7.1"
                                                                                                                                                                                                                                                                                                                                            al protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GGAGG,
                                                                                                                                                                    DB 2;
                                                                                                                404;
```

187 aa

CDS

CDS

RBS

Length

54;

Gaps

10;

CDS gene

```
31855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      31015
                                                                                                                                                                  31915
                                                                                                                                                                                                                                                                                                   31795
                                                                                                                                                                                                                                                                                                                                                                                                                                31675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                31615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             31375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           31135
                                                                   1042
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         31075
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                               999ccgtcaccccggccccacccgcccgttgccgaatagccccgcgggctccacct 924
ggcgccgcggcggcctcagcgctcgcgtacgcgccagcgcccgcagtaaagg
                                 AACGGGCCCCCAGCAACGTTTGGGTGGGCCCCTTGATCGCGTTGAGCAGGGTCT----
                                                    agcggacgccccagcaacagctgggtgggcgtgttcacaatgttgagcaggccctccaac
                                                                                                                 agcccgccggcccgccggcttgcccggttccccggttgcgccgttggccgcgttgccgatc
                                                                                                                                                                                                                                                                                                                    GCCCCGGTGCCCGGATGCGCTGCCGGCCGGCCCGGCCGCCCATGGCCCACAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ttgaagcctggcccgc---cggccccgccgatgccaccggctccgaacagcccggccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                actecgaaccegeeggeegeeggeeggeattggagaacageeeggeegeeeeggeeg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ccggtgaagatg---ccgccgtcgcctccggtgccgccgttccctccggccgagccggag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCGGCAAGGGTGGAGCTGTTGTCGTTGCCCCCGTTGCCGCCGGCACCGCCGTTGCCGCCG 31314
                                                                                                  AAGCCGCCGGGCCCACCGTTTTGCCCCGGGACCC-----CCGTCGGCGCCGTTGCCGATC
                                                                                                                                                                                                                                                                                                 CCGGCGCCCCCCCGCCGCCGGCGGGGCTGACGCCCCCGGCGGTGCCGAGCCCGGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CCGGCCCCGCCGTCGCCGTACAGCAGCCCGCCGCCGCCCTCCGTCACCACCGGCGCCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GCACCGCCGTTTCCGCCGTGCACCCCGGTCACCCCGTTGCTTCCGTTCCCACCAGCCCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CCGCCGTTACCGCCGTCACCGCCGGCGCCACCGTTGCCGATCAGCCCGGCGGCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CCGATCAGGGCGGCCGGCCACCACCCACCGCTGGCGCGGTGTTGCTGAGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCGGCCCCACCGCTGTTGCCGTGGCCACCGTTGCCGCCGTCGCCGCCGTTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ccgcccacgagttggttagcggtgcca---gttccgccggtgccgccggtcccggccgttg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TTGCCGATCAGCCCGACGTGCCCACCGGCCCCACCGGCCCCACCGGCCGCCGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ccgggacc---gaacagtgcgccggcaccgccgatgccgccgacgcctcctttgcc----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         atgccgccggccatttggtccgcactggaggcgccgaaccctccggtgcccccggcggccg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CCGCCGCCGCCGCTGCCGATCAGCCCGCCGATCCCCGCCGCCACCGCCGATGCCGCCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CCGGCGCCGTCACCGGCATTACCCGGCGTGGGAGCCTGTCCGCCGTTGCCGCCGTTCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -gecggtgeegeegggtegggegegeegagaeeggtteeggeggtgeegeea 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -cgctgtcgccgccggta 111
||| || ||||||
                                                                                                                                                                                                                                                                                                                                 864
                                                                                                                                                                                                                                                                                                                                                                                                804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         453
                                                                                                                                1041
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           510
                                                                  1101
                                                                                                  32028
                                                                                                                                                                31974
                                                                                                                                                                                                                                 31914
                                                                                                                                                                                                                                                                                                                                                                                                                                                               744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               687
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             31614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         31254
                                                                                                                                                                                                                                                                                                                                                                31794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               31674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            31494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        31134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      31074
                                                                                                                                                                                                                                                                                                                                                                                                                                31734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           31434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          31374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         31194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      171
```

δ В δõ В Qy DЬ

밁 δÃ

δÃ 멍 Š B 망 δÃ В δÃ 밁 QY 밁 Ş 밁 Š

밁

В Ş 덣

Ŷ, Ъ Qγ В Š 밁 Q Вþ Qγ

20 Db

69

gccgccgctaccggccgcgcccggacgctgtcgccgccggtaccgccggcggcgccgtc 128 GCCAATCCCACCGCTACCGCCGTTACCGCCATTGCCGATCAACACGGCGGTGCCACCGAT

2742

7;

2683

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 1
AF071081
LOCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                   BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEYWORDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VERSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCESSION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE
JOURNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
MEDLINE
PUBMED
                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              32084
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             repeat_region
                                                                                                                    Local Similarity
                             ø
gccagtcccgccggcggccaccagcgccgccgtcaccgatcaacccgccggtgccgccggt 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complete AF071081
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2 (bases 1 to 3946)
Espitia,C., Laclette,J.L., Mondragon-Palomino,
Espitia,C., Moreno,C. and Singh,M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The PE-PGRS glycine-rich proteins of Mycobacterium new family of fibronectin-binding proteins? Microbiology 145 (Pt 12), 3487-3495 (1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mycobacterium tuberculosis.
Mycobacterium tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (09-JUN-1998) GBF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Direct Submission
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Moreno,C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Campuzano, J., Martens, A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Espitia, C., Laclette, J.P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mycobacterium; Mycobacterium 1 (bases 1 to 3946)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AF071081.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Actinomycetales; Corynebacterineae; Mycobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10627046
                                                                                                                                                                                                                                                                                   518
                                                                                                                                                                                                                                                                                                                                                                                                                               /product="proline-rich mucin homolog"
/product="proline-rich mucin homolog"
/product="proline-rich mucin homolog"
/product="proline-rich mucin homolog"
/db_xref="G1:530535"
/db_
                                                                                                                                                                                                                                                                                   D
                                                                                                                                                                                                                                                                                   VFARKNSLIGSSSGDTAAASAAA"
1 1539 c 1347 g 542 t
                                                                                                                                                                                                                                                                                                                                          CPPVPPAPNRPPAPPAPPAPPELPAPPDPPTPPVANSPPAPPAPPAPPSALPFVNPPA
PPTPAAPKSRPALPAAPPAPPAPPVRATTPPPAPPAPPAPNSMALPPAPPDPPTPLLA
TPPAPPAPPLPMSPPAPPLPPAAPDPPAPPLTINQPPSPPLAPVPGAPLAPLPINGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /note="74kD protein"
/codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /strain="H37Rv"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /db_xref="taxon:1773"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /organism="Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GI:5305334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         _family="PGRS"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3946
                                                                                                                    29.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      dd
                                                                                                                    Score 338.8; DB 1;
Pred. No. 2.6e-14;
                                                                                          Mismatches
                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    , Mondragon-Palomino,M., Amador,A.,
Singh,M., Cicero,R., Zhang,Y. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         proline-rich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mascheroder
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tuberculosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tuberculosis'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BCT
mucin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Weg
                                                                                                                                                     Length
                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <u>`</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     homolog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Braunschweig
                                                                                                                                                        3946
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Martens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-JAN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculos is:
                                                                                       63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              32137
                                                                                          Gaps
```

```
1107
                                                                                                                                3640
                                                                                                                                                                            3580
                                                                                                                                                                                                                          3520
                                                                                                                                                                                                                                                                       3460
                                                                                                                                                                                                                                                                                                                    3400
                                                                                                                                                                                                                                                                                                                                                                 3340
                                                                                                                                                                                                                                                                                                                                                                                                               3280
                                                                                                                                                                                                                                                                                                                                                                                                                                                             3220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3040
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2860
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   129
                                                                                                                                                                                                  867
                                                                                                                                                                                                                                                                                            747
                                                                                                                                                                                                                                                                                                                                          699
                                                                                                                                                                                                                                                                                                                                                                                                                                     579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       297
                                                                                                        987
                                                                                                                                                                                                                                                807
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gcctccggtgccgccgttccctccggccgagccggagactccgaacccgccggcgcgcc 533
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CCCGCCGTTGCCGCCGCTCACCG ---CGCTGGCGCCACCGTTACCGCCGTTGGCGCCCGTT
                                                                                ACCGCCGTCCCCACCGATTCCGCCGGCGCCGCCGCGGCGCGCGAGGGCATGCCGGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gatgccggcgttgccgcccgcccgcccgcccgccctcaccgcccaccgagttggttagc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAGCAGCCCAGCGTTGCCGCCGGCGCCGCCGGCCGTCTATGCCGTCGGCCGTGAGAGT 3039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ggggtcgggcgcgagaccggttccggcggtgccgccaatgccgccagcgccgaagag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gccggccatttggtccgcactggaggcgccgaaccctccggtgcccccggcgccgcggg
  cgcggcggcggcctcagcgctcgcgtacgcgccagcagcagcagtaaaggtttg
                                                                                                                                         gccgccggcctggccgggccccggacccgccgccgccgttgccgtacagccc
                                                                                                                                                                            gccgtcaccccggcccacccgccgccgttgccgaatagccccgcgggctccacctgg
                                                                                                                                                                                                                         GCCGGCGCCGAACAGCATGGCGTTGCCGCCGGCTCCGCCGGACCCGCCGATCCCACTGCT
                                                                                                                                                                                                                                     gccggagccgaacagccagcccgccggcccgccggccagccgcgttgcccgg
                                                                                                                                                                                                                                                                       GCCGGCGCCGCCGCCCGCGCGTGAGGGCTACTACGCCGCCGCCGCCGGCGCCGCCGCCGCCC
                                                                                                                                                                                                                                                                                 gccgtcgccgccgagcccgcctgtgccggtgttcccgactccgccggggccccccgggcgcc
                                                                                                                                                                                                                                                                                                                   TCCGCCGGCCCGACTCCGGCGCGCGCGAAGAGCAGGCCGGCGTTGCCGGCAGCCCC
                                                                                                                                                                                                                                                                                                                              cccgccggccgccgatgccaccggctccgaacagc-----ccggccgcccc
                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTCGGCGAACCCGCCATGCCCGCCGGTGCCGGCCGGCGCCGAACAGACCGCCAGCGCCACC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CCCGCCTGCGCCGAACAGCCCGCCGGCCCGGCCGGCCGCCGACTCCGCCGAAGCTGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ATTGCCGCCGGCCGCCGTCCCCGCCGGCGACCAGGCTGTCCCGCCGCCGCCTTC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCCGCCGTTGGCGCCGGCCGCCGGAGCCGAAGACCGTGCCGGTGTTTGCCCCCCGGGGCC
                                                         acyccccagcaacagctgggtgggcgtgttcacaatgttgagcaggccctccaacggcgc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ggtgccagttccgccggtgccgccgttgccggtgaagatgccgccgtc 473
                                                                                                                               CGCGCCGGATCCTCCGGCGCCGCCGTTGACGATTAACCAGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -ccgccattggagaacagcccgccgccgccggtgccgcc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3099
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2979
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2799
                                    3801
                                                           1106
                                                                                                       1046
                                                                                                                               3690
                                                                                                                                                                            3639
                                                                                                                                                                                                   926
                                                                                                                                                                                                                         3579
                                                                                                                                                                                                                                                                      3519
                                                                                                                                                                                                                                                                                            806
                                                                                                                                                                                                                                                                                                                   3459
                                                                                                                                                                                                                                                                                                                                          746
                                                                                                                                                                                                                                                                                                                                                                                        869
                                                                                                                                                                                                                                                                                                                                                                                                                                                             3279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          3219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   176
                                                                                  3750
                                                                                                                                                     986
                                                                                                                                                                                                                                                866
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REFERENCE
AUTHORS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ACCESSION
VERSION
KEYWORDS
                                    рЬ
                                                       Ωy
                                                                                                   Qy
                                                                                                                              DЪ
                                                                                                                                                   Qy
                                                                                                                                                                                                Qy
                                                                                                                                                                                                                         Вþ
                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                            QУ
                                                                                                                                                                                                                                                                                                                   ₽
                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                      δõ
                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ωy
             δõ
                                                                                  망
                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORIGIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             BASE COUNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ORGANISM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOURNAL
                                                                                  3160
                                                                                                                                                                            3040
                                                                                                                                                                                                                         2980
                                                                                                                                                                                                                                                                       2920
                                                                                                                                                                                                                                                                                                                    2860
                                                                                                                                                                                                                                                                                                                                                                 2800
                                                                                                                                                                                                                                                                                                                                                                                                               2743
                                                                                                                                                                                                                                                                                                                                                                                                                                                             2683
                                                                                                        474
                                                                                                                                                                                                                                                                                                                                                                                        129
              579
                                                                                                                                                     417
                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                          177
                                                                                                                                                                                                                                                                                                                                                                                                                                      69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                                GTCGGCGAACCCGCCATGCCCGCCGGTGCCGCCGGCGCCGAACAGACCGCCAGCGCCACC
                                                                                                                                         ---ggtgccagttccgccggtgccggccgttgccggtgaagatgccgccgtc 473
                                                                                                                               ATTGCCGCCGCCCGCCGCCGCCGGCGACCAGGCTGTCCCGCCGCCTGCCCCCTTC
```

망 δõ В δÃ Ъ Qy 멍 Ωy В Qy В Qγ

Qy В δÃ В Qy 밁 δÃ

ρ 밁 Qy В

ccgccattggagaacagcccgccgcccccccgccggtgccgcc

3279

578

3219

3159

헣

밁 δÃ Вр δÕ 밁 οy DЬ δÃ Вb

```
RESULT 15
A93410
LOCUS
DEFINITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3802
                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
nes 719; Conserv
                                                                                                                                                                                                                                                                                                                                                                               gccagtcccgccggcgccaccaccgcrgccgccgtcaccgatcacccgccggtgcgccgcggt
                                                                                                                                                                                                                                                                                                                  CCCGCCGTTGCCGCCGGTCACCG----CGCTGGCGCCACCGTTACCGCCGTTGGCGCCCGTT 2799
                                                                                                                                                                                                                                                                                                                                gccggccatttggtccgcactggaggcgccgaaccctccggtgcccccgggcgccgccggg
                                                                                                                                                                                                                                                                    gccgatcagcttggcggcccgccgccgctgccaccggacccgccc-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CACCGCGGCGCCTCGGCGGCCGCCATAGGCGCCGCCACCGGAGGTCAATGCCTG
                gatgccggcgttgccgcccgcccgcccgccccgccctcaccgcccacgagttggttagc 416
                                                                                                                                         accgaacagtgcgccggccgccgatgccgccgacgcctcctttgccgccggtgccgcc
                                                                                                                                                                                                                                                    GAGCAGCCCAGCGTTGCCGCCGGCGCCCGCCGGCGCCGTCTATGCCGTCGGCCGTGAGAGT
                                                                             ggggtcgggcgcgagaccggttccggcggtgccgccaatgccgccgccgccgaagag
                                                                                                                           GTCTTGCCCGCCGTCGGAGAAGCCGAATCCGCCGGCGCCGCCGGAGCCGGAGCCGAA
                                                                                                                                                                                       TCCGCCGTTGGCGCCGGCGCCGGAGCCGAAGACCGTGCCGGTGTTGCCCCCGGGGCC
unidentified unidentified unclassified.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INFECTION
INFECTION
Patent: WO 9741252-A 06-NOV-1997;
BIOTECHNOLOG FORSCHUNG GMBH (DE);
LOCATION/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 (bases 1 to 3946)
Singh,M. and Honisch,C.
DNA, RNA AND A PROTEIN USEFUL FOR DETECTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 6 from A93410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A93410.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A93410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         518
                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="unidentified"
/db_xref="taxon:32644"
1539 c 1347 g 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GI:6741661
                                                                                                                                                                                                                                                                                                                                                                                                                                                           29.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3946 bp
rom Patent
                                                                                                                                                                                                                                                                                                                                                                                                                                             0; Mismatches 412;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 338.8; DB 81; Pred. No. 2.6e-14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DNA
W09741252.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SINGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MAHAVIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PAT
                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   OF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A MYCOBACTERIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22-JAN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                             63;
                                                                                                                                                                                                                                                                                gatgcc 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3855
                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                    2859
                                                              3039
                                                                                                                           2979
                                                                                                                                                                                         2919
                                                                                                                                                                                                                                                                                                                                                                                 2742
3099
                                                                                           356
```

7;

Search completed: January 12, 2001, 20:13:40 Job time: 26994 sec

```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                 Database :
                                                                                                                                                                                                                                                                                  Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                     Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Run on:
                                                                                                                                                                                                                                                                                                                                                                                                       tal number of hits satisfying chosen parameters:
   SPTREMBL_15:*
1: sp_archea:*
2: sp_bacteria:
3: sp_fungi:*
4: sp_human:*
5: sp_inverteb:
6: sp_manmal:*
7: sp_mhc:*
8: sp_organel1:*
9: sp_phage:*
10: sp_plant:*
11: sp_rodent:*
12: sp_virus:*
13: sp_vertebra:
13: sp_vertebra:
14: sp_unclass:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 January 5, 2001, 14:30:45; Search time 115.27 Seconds (without alignments) 392.489 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-461-774-10
2216
1 NSMPVPPAPPAPPAPPSPINPPV.....NGAAAAASALAYAPAPAVKV 386
                                                                                                                                                                                                                                                                                                                                                                                                                                             374700 seqs, 117207915 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version 4.5 Copyright (c) 1993 - 2000 Compugen Ltd.
sp_phage:*
sp_plant:*
sp_rodent:*
sp_virus:*
sp_virus:*
sp_vertebrate:*
sp_unclassified:*
                                                                                                                                                                                            sp_archea:*
sp_bacteria:*
sp_fungi:*
                                                                                                                        sp_invertebrate:*
sp_mammal:*
sp_mhc:*
                                                                                                         sp_organelle:*
                                                                                                                                                                                                                                                                                                                                                                                                            374700
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

																				Result
7	5 6	b	17	16	5	14	ū	2	Ξ	0	ص ا	α	7	6	G	4	· w	2	, р) [
0 40	n (7 70	554.5	555.5	558	571	571.5	577.5	600	605.5	638.5	642.5	645.5	652.5	659	670.5	687	831	1065.5	Score
24./) A	ر د	25.0	25.1	25.2	25.8	25.8	26.1	27.1	27.3	28.8	29.0	29.1	29.4	29.7	30.3	31.0	37.5	48.1	Query Match
900) # 1 L	A 7.	1480	432	388	580	839	711	761	1006	998	3247	1315	446	489	1188	760	409	763	Query Match Length
ī	٠ ١		10	10	10	10	10	10	10	10	0	12	10	υ	10	10	10	10	2	DB
QYLJ64	(CO 6)	063775	Q9LIE8	Q39835	Q09082	Q09083	Q9SN46	Q9SPM1	Q9ZQI0	Q9LMQ1	Q9N1D1	Q65553		Q9VZC2	Q41707	Q41805	Q9T0K5	Q9SBM1	Q9XDH2	ID
Q91]64 arabidopsis			· .	Q39835 qlycine max	Q09082 lycopersico	Q09083 phaseolus v	٠.			Q91mq1 arabidopsis	Q9nld1 gorilla gor	Q65553 bovine herp	Q9spm0 zea mays (m	Q9vzc2 drosophila	Q41707 vigna ungui	Q41805 zea mays (m	Q9t0k5 arabidopsis	Q9sbm1 volvox cart	Q9xdh2 mycobacteri	Description

45 487.		73 77 77			49			36 502				32 505												
22.0	22.2	22.5	22.3	22.3	22.4	22.5	22.7	22.7	22.7	22.8	22.8	22.8	23.1	23.2	23.3	23.4	23.5	23.7	23.8	24.	24.	24.	24.	24.
707	1404																			416			485	707
10 Q9STM7	000054	TO CANTRA				_		10 Q40692		10 082066				12 041935	_		10 Q43682			10 Q40402	10 065375	_	11 Q9Z0G8	5 Q9VZB2
Q9stm7 arabidopsis	Q18/56 caenornabdi		Q41719 zea diplope							O82066 solanum tub	O42854 schizosacch	Q9xi19 arabidopsis	Q07229 saccharomyc									arabid	כיא	Q9vzb2 drog #1.1a

ALIGNMENTS

INTERPRO; IPRO02951; INTERPRO; IPRO02965; INTERPRO; IPRO02966; INTERPRO; IPRO02966; PRINTS; PRO1217; PRICHEXTENSN. PRINTS; PRO12218; PSTLEXTENSIN. PRINTS; PRO12218; PSTLEXTENSIN. PRINTS; PRO1222; ATROPHIN. SEQUENCE 763 AA; 75034 MW; 39168EC45; PRINTS; PRO1222 ATROPHIN. SEQUENCE 763 AA; 75034 MW; 39168EC45; TY Match 48.1%; Score 1065.5 TL Local Similarity 42.5%; Pred. No. 2. The Local Similarity 42.5%; Pred. No. 2. The Conservative 31; Mismatche 233; Conservative 31; Mismatche 4 PVPPAPPAPPAPPPPPPPPPPPPPPPPPPPPPPPPPP	IPR002951; IPR002965; IPR002965;	Qy 55 -E Db 290 NE	Qy 4 PV Db 235 PA	Query Match Best Local 9 Matches 23		DR INTERPRO; DR INTERPRO; DR INTERPRO; DR PRINTS; P		Sul	Zh "C is Sul	SES SES SES SES SES SES SES SES SES SES			
ENSIN. MW; 39168EC45/ 8; Score 1065.5 9; Pred. No. 2 31; Pred. No. 2 31; Pred. IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	ENSIN. MW; 39168EC45A5916F8 CRC64; MW; 39168EC45A5916F8 CRC64; %; Pred. No. 2.6e-69; 31; Mismatches 91; Indels 19; PPLPAAPRTLSPPVPPAPPSPISLAAPPL	PPAPPAAPVPGVPLAPLP	PPAPPAPPSPINPPVPPV - - 	Similarity 3; Conservai	PRO1218; PSTLEXTE PRO1222; ATROPHIN E 763 AA; 75034	00; IPR002951; 00; IPR002965; 00; IPR002966; PR01217; PRICHEXT	D 15500001	Submitted (JUN-1998) to the EMBL/GenBank/DDBJ EMBL; AF071081; AAD41594.1;	Zhang Y., Moreno C., Singh M.; "Cloning and characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of a new member of the PGRS family "Cloning and Characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and characterization of a new member of the PGRS family "Cloning and Characterization of a new member of the PGRS family "Cloning and Characterization of a new member of the PGRS family "Cloning and Characterization of a new member of the PGRS family "Cloning and Characterization of a new member of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning and Characterization of the PGRS family "Cloning an	SEQUENCE FROM N.A. STRAIN-H37RV; SERSPITIA C., Laclette J.L. Ekspitia C., Laclette J.L. Zhang Y., Moreno C., Sing Thang Y., Moreno C., Sing "Cloning and characteriza is a useful marker of pol Submitted (JUN-1998) to the EMBL; AF071081; AAA41594	Actinomycetales; Corynebacterineae; Mycobacteriaceae; Mycobacterium NCBI_TaxID=1773; [1] SEQUENCE FROM N.A. STRAIN=H37RV; Espitia C., Laclette J.L., Mondragon-Palomino M., Martens A., Espitia C., Laclette J.L., Mondragon-Palomino M., Martens A., Ehang Y., Moreno C., Singh M.; "Cloning and characterization of a new member of the PGRS family the sa useful marker of polymorphism in Mycobacterium tuberculosis."; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases. EMBL; AR071081; AAD41594.1;	Mycobacterium tuberculosis. Bacteria; Firmicutes; Actinobacteria; Actinobacteridae Bacteria; Firmicutes; Actinobacteriaeae; Mycobacteriaceae; Mycobacteriaceae; Mycobacteriaceae; [1] SEQUENCE FROM N.A. STRAIN=H37RV; Espitia C., Laclette J.L., Mondragon-Palomino M., Mart Zhang Y., Moreno C., Singh M.; "Cloning and characterization of a new member of the P is a useful marker of polymorphism in Mycobacterium tu Submitted (JUN-1998) to the EMBL/GenBank/DDBJ database EMBL; AR071081; AAA041594,1;	01-NOV-1999 (TERMBLEGI. 12 01-JUN-1999 (TERMBLEGI. 12 01-JUN-2000 (TERMBLEGI. 14 PROLINE-RICH MUCIN HOMOLOG MYCODACTETIUM TUDETCULOSIS BACCLINOMYCETALES; COTYNEDAC ACLINOMYCETALES; COTYNEDAC (CI) [1] STRAIN=H37RV; ESPOILIA C., Laclette J.L., ESPOILIA C., Moreno C., Singh "Cloning and characterizat is a useful marker of poly Submitted (JUN-1998) to th EMBL; AFF7/1081; AAD41594.1
m - m - m - 0 - /n - 7-	A5916FB CRC64; 5; DB 2; Length 76. 66-69; es 91; Indels 19. PAPPSPISLAAPPL :::	PNSHPPAPPSAPVPGV	VPPLPAAPRTLSPPVP : VPPLPPVPNKI-PPAP	1 %; 5 %; 3 1		TENSN.	. ! .	tymorphism in My the EMBL/GenBank	gh M.; ation of a new member lymorphism in Mycobac the EMBL/GenBank/DDBJ	J.L., Mondragon-Palomino M., Martens Singh M.; srization of a new member of the PGRS f polymorphism in Mycobacterium tuber to the EMBL/GenBank/DDBJ databases.	acterineae; Myco ,, Mondragon-Pal gh M.; ation of a new m lymorphism in My the EMBL/GenBank	is. tinobacteria; Ac acterineae; Myco acterineae; Myco ., Mondragon-Pal gh M;; gh M;; ation of a new m lymorphism in My the EMBL/GenBank	12, Created) 12, Last sequence update) 14, Last annotation update) SiG. ctinobacteria; Actinobacteri ctinobacteriae; Mycobacteriacea bacterineae; Mycobacteriacea L., Mondragon-Palomino M., M ngh M.; zation of a new member of th olymorphism in Mycobacterium the EMBL/GenBank/DDBJ datab

s_t t

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
Q9SBM1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                               RT RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT DR RT 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RN OCC OC GREAT DATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             дЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δõ
Query Match
Best Local Similarity
Matches 181; Conserv
                                                                                                                                                      Signal.
SIGNAL
                                                                                                            CHAIN
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                             "Response to the sexual pheromone and Volvox: induction of an extracellular exclusively of hydroxyproline.";
J. Biol. Chem. 274:35023-35028(1999).
EMBL; AJ242540; CAB62280.1; ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
STRAIN-HK10;
Ender F., Hallmann
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Volvox carteri f. nagariensis.
Eukaryota; Viridiplantae; Chlorophyta;
Volvocaceae; Volvox.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-MAY-2000 (TrEMBLrel. 13, Creat
01-MAY-2000 (TrEMBLrel. 13, Last
01-JUN-2000 (TrEMBLrel. 14, Last
HYDROXYPROLINE-RICH GLYCOPROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9SBM1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         09SBM1
                                                                                                                                                                                                  PRINTS;
                                                                                                                                                                                                                         PRINTS;
                                                                                                                                                                                                                                                                                       INTERPRO;
                                                                                                                                                                                                                                                                                          INTERPRO; IPRO00216; -.
INTERPRO; IPRO02965; -.
INTERPRO; IPRO02966; -.
INTERPRO; IPRO03072; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=3068;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HRGP GENE.
                                                                                                                                                                                                                                                  PRINTS;
                                                                                                                                                                                                                                                                       PRINTS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      588
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            528
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 468
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---PAAPPSPTSWLAVPVPPVPPVPPLP--VKMPPSPPVPPFPPAEPET----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TAAASAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --APDPPAPPLTINQPPSPPLAPVPGAPLAPLPINGRPVFARKNSLIG-----SSSGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPISGRP----SNSWVGVFTMLSRPSNGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KPNPPAPPEPPEPKSSPALPPAPPAPSMPSAVRVPPSPPIPPAPPAAPRASMPALPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAAASALA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PVPVFPTPPGPPAPPEPNSS--PPAPPAPPAPLPGPSPPAPPAPPLPNSPAAPPGPPAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ELPAPPDPPTPPVANSPPAPPAPPAPPSALPFVNPPAPPTPAAPKSRPALPAAPPAPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SPPATRLCPPLPPSPPAPNSPPAPPAPPTPPKLLSANPPCPPVPPAPNRPPAPPAPPAPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALAPPLPPLAPLPISPGVPPAPPIPPGK--PWTTPPLAPAPPEPKTVPVLPPGPSCPPSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCRVCSGEVLAGALNPSRPSRSPLTTTTPALPAPIPPLPPLPPLPINTAVPPIPPLPPVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PVRATTPPPAPPAPPAPNSMALPPAPPDPPIPLL--ATPPAPPAPPLPMSPPAPPLPPA-
                                                                                                                                                                                                                       PR00239;
PR01217;
PR01218;
                                                                                                                                                                                                    PR01286;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hallmann A.,
                                                                                                               18
409 /
    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -ANTSNSPLRPPAPPAPPLK - - - PGPPAPPMPPAPNS - - -
                                                                                                               AA;
                                                                                                                                                                                                                                                                       RHODOPSNTAIL
                                                                                                                                                                                                                                                  PRICHEXTENSN
                                                                                                                                                                                                    NORNUCRECPTR
                                                                                                                                                                                                                         PSTLEXTENSIN
                                                                                                            41547
                                                                                                                                                             17
                    37.5%;
48.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Amon P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13,
                                                                                                               MΨ;
    15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
  Score 831; DB 10;
Pred. No. 1e-52;
5; Mismatches 114;
                                                                                                               HYDROXYPROLINE-RICH GLYCOPROTEIN CD0749C6AF02BD74 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---ALEAPNPPVPPAPPGP-NSA--PAPPMPP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sumper M.;
ne and woun
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence update) annotation update) DZ-HRGP PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           409
                                                                                                                                                                                                                                                                                                                                                                                                                                                  glycoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         wounding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Chlorophyceae;
      114;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in
                                         Length 409;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                the green alga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Volvocales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -PAAPPSPPSP
    62;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----P
                                                                                                                                      DZ-HRGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                  almost
    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      647
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           90
    22;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δõ
       ALD DARRED DARRED REPRESENTATION OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q9TOK5 PRELIMINARY;
Q9TOK5;
Q9TOK5;
Q1-MAY-2000 (TrEMBLrel. 13, C
Q1-MAY-2000 (TREMBLrel. 13, L
Q1-QCT-2000 (TREMBLrel. 15, L
EXTENSIN-LIKE PROTEIN.
T9EB.80 QR AT4G13340.
EU Arabidopsis sequencing projects submitted (MAR-2000) to the EMBL EMBL; AL049608; CAB40769.1; -. EMBL; AL161536; CAB73376.1; -. INTERPRO; IPR002965; -. INTERPRO; IPR002966; -. INTERPRO; IPR002966; -. INTERPRO; IPR01217; PRICHEXTENSN. PRINTS; PR01218; PSTLEXTENSIN. PRINTS; PR01218; PSTLEXTENSIN. SEQUENCE 760 AA; 82245 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
SEQUENCE FROM N.A.
RAVAN M., PODI T., Weizenegger
RAVAN M., PODI T., Weizenegger
                                                                                                                                                                                                                                                                                                                                                                                             Pohl.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                            SEQUENCE OF 348-747 FI Robben J., Grymonprez Mayer K.F.X.;
                                                                                                                                                                                                                                                                                                                                                                        Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=3702;
                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                         Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Arabidopsis sequencing project; omitted (APR-1999) to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGVVGFFPDYEW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPPPSPPPRPP-PPSPNPPRPPPPSPSPPKPPPPPSPPPRPPRRPPRRPPRRP----PTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APLPGPSPPAPPAPPLPNSPAAPPGPPAWPGAPDPPA-PPLPXSSPPAPPACPVPGAPLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPMPPAPNSPAAPPSPPSP-PVPVFPTPPGP-----PAPPEPNSSPPAPPA----PPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPLENSP-PPPPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAP-PAPPLKPGP-PA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APP--APPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPPAP----PA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPAPPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PLPISGRPSNSW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Weizenegger
1 (MAR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (APR-1999)
                                                                                                                                                                                                                                                         (MAR-2000)
                                                                                                                                                                                                                                                                                                                           348-747 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   355
                                                                                                                                                                                                                                                         ť
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ç
                                                                                                                                                                                                                                                                                                                                                                      ţ.
                                                                                                                                                                                                                                                                                                   В.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the
                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                      Mewes H.W., Lemcke K., Mayer K.F.X., the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                    project;
                                                                                                                                                                                                                                                                                                      Volckaert
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Created)
Last sequence up
                                                                                                                                                              EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                           EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                T:,
       20CDE1C8E6CEECFC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bancroft I.,
                                                                                                                                                                                                                                                                                                      G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         760
                                                                                                                                                                                                                                                                                                        Mewes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               update)
                                                                                                                                                                                                                                                                                                      H.W.,
                                                                                                                                                                 databases
                                                                                                                                                                                                                                                           databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        databases
       CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mewes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      65
```

```
RESULT
Q4 1805
ID Q4
DT Q1
DT Q1
DT Q1
DT Q1
DT Q1
C ECC
OC                                                                                                δÃ
                                                                                                                                                        В
                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                рЬ
Ωy
                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q41805 PRELIMINARY; PRT; 1188 AA. Q41805.
Q41805 O1-NOV-1996 (TrEMBLrel. 01, Created)
O1-NOV-1996 (TrEMBLrel. 01, Last sequence update)
O1-JUN-2000 (TrEMBLrel. 14, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN-B73; TISSUE-POLLEN;
Rubinstein A.L., Broadwater A.H., Lowrey K., B
Submitted (JUN-1994) to the EMBL/GenBank/DDBJ
EMBL; Z34465; CA84230.1; -.
MENDEL; 14346; Zeama; 2368; 14346.
INTERPRO; IPR001611; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                  Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Zea mays (Maize).
Eukaryota; Viridiplantae; E
Magnoliophyta; Liliopsida;
NCHI_TaxID=4577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EXTENSIN-LIKE PROTEIN PRECURSOR.
                                                                                                                                                          524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          610
     114
                                                        584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  729
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   495
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           392
                                                                                                     59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61 AIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPV--PPGSGAPRPVPAVPPMPPAPK 118
                                                                                                                                                                                                             N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5
                                                                                                                                                                                                SMPVP----PAPPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPM
                                                                                                                                                     SPPAPIGSPSPPPPVSVVSPPPPVKSPPPPAPVGSPPPPEKSPPPPAPVASPPPPVKSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SPPPPEPYYYSSPPPPHSSPPPHSPPPPHSPPPPTYPYLSPP-PPPTPVSSPPPTPVYSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PPAPKRMPALP --- PAPPAP--
                                                  PPTL---VASPPPPVKSPPPPAPVASPPPPVKSPPPPTPVASPPPPAPVASSPPPMKSPP
                                                                                                  PPAIWSALEAPNPPV-PPAPPGPNSAPAPPM----PPTPPLPPVPPGSGAPRPVPAVPPM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PGAPDPPAP----PLP----YSSPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPAPPLKPGPPAP-----PMPPAP-----NSPAAPP-----SPPSPPVPVFPTPPGPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TPNPPAP----PAPPLENSPPPPPPPPPPPPL--TLNPPVPPAPPAANTSNSPLRPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YSP--PPPPPPPPPPV--YSPPPPPVYSSPPPPPSPAPTPVYCTRPPPPPPHSPPPPQF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VSPRPPV-VTPLPPPSLPSPPPPAPIFSTPPTLTSPPPPSPPPPV--YSP--PPPPPPPPP
                                                                                                                                                                                                                                                          190;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HQSPPPPSPEYEGPLPPVIGVSYASPPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SSPPPPEVHYHSPPPSPVHYSSPPPPPSAPCEESPPPAPVVHHSPPPPPMVHHSPP-PPVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -APPEP----NSSPP----APPAPPAAPLPGPSPPAP---PAPPLPNSPAAPPGPPAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPPPPCIEPPPPPCIEYSPPPPPPVVHYSSPPPPPVVYYSSPPPPPPVYYSSPPPPPPVHY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RMPALPPAPPAPPSPPTSWLAVPVPPV---PPVPPLPVKMP----PSPPVPPFPPAEPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                PF00560; LRR;
                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                  1188
                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ĀĄ;
                                                                                                                                                                                                                                                                                                                                                                                  27
120980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ω.
                                                                                                                                                                                                                                                                          30.3%;
32.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   31.0%;
42.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Embryophyta; Tracheophyta; ; Poales; Poaceae; Zea.
                                                                                                                                                                                                                                                        37;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30; Mismatches 112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 687; DB 10;
Pred. No. 3.4e-42;
                                                                                                                                                                                                                                                     Score 670.5; DB 10;
Pred. No. 7.2e-41;
Pred. Mismatches 149;
                                                                                                                                                                                                                                                                                                                                                                                  POTENTIAL.
MW; 2C77C7F8D7130149
  --PSPPTSWLAVPVP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  758
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bedinger P.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                     CRC64;
                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Spermatophyta,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -PPSPPPPPPPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           760;
                                                                                                                                                                                                                                                     215;
                                                                                                                                                                                                                                                                                                        1188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           84;
  -- qvq--
                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                  640
                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          609
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        267
                                                                                                                                                                                                                                                     28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           24;
```

```
Q
                               ф
                                                        QУ
                                                                                         В
                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT
Q41707
                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δō
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫄
                                                                                                                                                  Matches
                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                          Signal.
SIGNAL
SEQUENCE
                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.

SEQUENCE FROM N.A.

MEDLINE=9715574; PubMed=9002273;

Arsenijevic-Maksimovic I., Broughton W.J., Krause
Arsenijevic-Maksimovic I., Broughton W.J., Krause
"Rhizobia modulate root-hair-specific expression c
Mol. Plant Microbe Interact. 10:95-101(1997).

EMBL; X91836; CAA62943.1; -.

EMBL; X86030; CAA60022.1; -.

MENDEL; 16557; Vigun; 2930; 16557.
                                                                                                                                                                                                                                                                                                                                                                                                        Vigna unguiculata (Cowpea).

Bukaryota; Viridiplantae; Embryophyta; Tr

Magnoliophyta; eudicotyledons; core eudic

Fabales; Fabaceae; Papilionoideae; Vigna.

NCBI_TaxID=3917;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 041707; 043689;
01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-JUN-2000 (TrEMBLrel. 14, Last annotation update)
EXTENSIN CLASS 1 PROTEIN PRECURSOR (EXTENSIN-LIKE PROTEIN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1061
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q41707
                                145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      881
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                821
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 641
   101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       701
                                                           50
                                                                                       86 PSPPPPYVYKSPPPPSP-SPPPPYYYYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKS
                                                                                                                                                                 Local Similarity
                                                                                                          4 PVPPAP----PAPPSPINPPVP-----PVPPLPAAPRTL---SPPVP-PAPPSPISLAA
                             PPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPPPYYYKSPPPPSPSPPPPY
 --SGAPRPVPAVPP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPPAPISSPPPPVKSPPPPAPVS-----SPPPPVKSPPPPAPVSSPPPPIK 1106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VPGAPLA--PLPISGRPSNSWVGVFTMLSRPSNGAAAAASALAYAPAPAVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --SPPAP----PAPPLP-NSPAAP----PGPPAWPGAPDPPA----PPLPYSSPPAPPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STPPAPTTVISPPSEPKSSPPPTPVSLPPPIVKSSPPPAMVSSPPMTPKSSPPPVVVSSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KPTPPSTPSKPPSSPEKPSPPKEPVSSPPQTPKSSPPPAPVSSPPPTPVSSPPALAPVSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PPTPVSSPPPPEKSPPPPPAKSTPPPEEYPTPVTSVKSSPPPEKSLPPPTLIPSPPPQE
                                                         PPLPPDPPMPPAIWSALEAPNPPVPP----APPGPNSAPAPP---MPPTPPLPPVPPG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MSSPPPPEVKSPPPPAPVSSPPPPVKSPPPPAPVSSPPPPVKSPPPPAPVSSPPPPVKSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PPTVKSSPPPAPVSSPPATPKSSPPPAPVNLPPPEVKSSPPPTPVSSPPPAPKSSPPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -MPPAPNSPAAPPSPPS----PPVPVFPTPP-----GPPA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APLSSPPLAPKSSPPHVVVSSPPPVVKSSPPPAPVSSPPLTPKPASPPAHVSSPPEVVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPSVKSSPPPAPLSSPPPAPQVKSSPPPVQVSSPPPAPKSSPPLAPVSSPPQVEKTSPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -PVPPLPVKMPPSPPVPPFPPAE----PETPN---PPA----
                                                                                                                                                                                                                            489
                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -PPEPNSSPPA----
                                                                                                                                                                                                                          AA;
                                                                                                                                                                                                                          23
53896 MW;
                                                                                                                                                               29.78;
-MPPAPKRMPALP-----PAPPAPPSPPTSWLAVPVPPVP-P
                                                                                                                                                                                                                                                                                                                                                                                                                                       Embryophyta; Tracheophyta; Spermatophyta;
lons; core eudicots; Rosidae; eurosids I;
                                                                                                                                                 27;
                                                                                                                                                               Score 659; DB 10;
Pred. No. 2.5e-40;
                                                                                                                                                                                                                       POTENTIAL.
E927EF520CE258B3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -PPAP-PAPPLKPGPPAPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ð
                                                                                                                                                 144;
                                                                                                                                                                                                                          CRC64;
                                                                                                                                                                                                                                                                                                                                  of A
                                                                                                                                                                             Length
                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                extensin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -PPAPPAAPLPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ---PPA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  385
                                                                                                                                                 74;
                                                                                                                                                                                                                                                                                                                                genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -PPA
                                                                                                                                            Gaps
                                                                                                                     49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1060
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1,000
                             204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                880
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     940
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ,268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       290
                                                                                                                                                 27;
```

20;

```
RA Adams D.D. Celnikers S.E., Holt R.A., Evans C.A., Gocayne J.D., Addies P.G., Scherer S.E., Li P.W., Hoskins R.A., Galle R.F., RA Adams M.D., Celnikers S.E., Holt R.A., Ashburner M., Honderson S.N., RA Burton G.G., Wortman J.R., Yandell M.D., Zhang Q., Chen L.X., RA Burton R.C., Rogers Y.-H.C., Blazej R.G., Champe M., Pfeiffer B.D., RA Burton R.C., Rogers Y.-H.C., Blazej R.G., Champe M., Pfeiffer B.D., RA Burton R.C., Rogers Y.-H.C., Blazej R.G., Champe M., Pfeiffer B.D., RA Burtis H.D., Dayla Ktaroglu L., Beasley E.M., RA Ballew R.M., Baxua A., Baxendale J., Bayraktaroglu L., Beasley E.M., RA Borkova D., Botchan M.R., Bouck J., Bayraktaroglu L., Beasley E.M., RA Beeson K.Y., Benos P.V., Berman B.P., Bhandari D., Bolshakov S., Cherry J.M., Cawley S., Dahlke C., Davenport L.B., Davles P., Burtis K.C., Busam D.A., Butler H., Cadleu E., Center A., Chandra I., Cherry J.M., Cawley S., Dahlke C., Davenport L.B., Davles P., RA Dodson K., Doup L.B., Downes M., Dugan-Rocha S., Dunkov B.C., Dunn P., RA Dodson K., Doup L.B., Downes M., Dugan-Rocha S., Dunkov B.C., Dunn P., RA Fosler C., Gabrielian A.E., Garg N.S., Gelbart W.M., Glasser K., Glodek A., Gong F., Gorrell J.H., Gu Z., Guan P., Harris M., Alasko P., Lei Y., Levitsky A.A., H., Glasser K., Ra Hostin D., Houston K.A., Howland T.J., Weil M.-H., Ibegwam C., Mattol B., McIntosh T.C., Kraft C., Kravitz S., Kulp D., Ial Z., Lin X., Lasko P., Lei Y., Levitsky A.A., Li J., Li Z., Liang Y., Lin X., RA Lasko P., Lei Y., Levitsky A.A., Li J., Li Z., Liang Y., Lin X., RA Melnicl B.B., McIntosh T.C., McLeod M.P., McPherson D., RA Merkulov G., Milshina N.V., Mobarry C., Morris J., Moshrefi A., RA Melson D.R., Nelson K.A., Nixon K., Nusskern D.R., Pacleb J.M., RA Shue B.C., Siden K., Saunders R.D.C., Scheeler F., Shen H., Shen H., Shen H., Shen B., Shen H., Shen H., Shen B., Shen H., Shen B., Woodage T., Wonter E., Wang A.H., Wang X., Zhon Y., Yeh R., P., Zaveri J.S., Zhan M., Zhang S., Zhu X., Smith H.O.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eukaryota; Metazoa; Arthropoda; Tracheata; Hexapoda; Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Brachycera; Musc
Ephydroidea; Drosophilidae; Drosophila.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-MAY-2000 (TrEMBLrel.
01-MAY-2000 (TrEMBLrel.
01-JUN-2000 (TrEMBLrel.
CG15021 PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN=BERKELEY;
MEDLINE=20196006; PubMed=10731132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Drosophila melanogaster
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Q9VZC2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   442 -- PPYYYKSPP--PPSPSPP-PPYYYKSPPPPSPSPPP--PYYPYLYNSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAPP----GPPAWPGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPISGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YKSPPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---PTPPGP-PAPPEPNSSPPAP-PAPP-----AAPLPGPSPPAP-----PAPPLPNSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VPPLPVKMPPSPPVPPFPPAEPETPNPPAP-PAPPLENSPPPPPVPPVPPVPPLTLNPPV 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PSPSPPPPYYYKSP--PPPSPSPPPPPYVYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPPYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P-PAPPAANTSNSPLRPPAPPAPP----LKPGPPAPPMPPAPNSPAAPPSP-PSPPVPVF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPPYYYKSPPPP-SPSPPPPYYYKSPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRELIMINARY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            13,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (Fruit fly)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Muscomorpha;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  264
```

```
RESULT
Q9SPMO
                                                                                                                                                                                                                                                                                                                                                                                                                γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            р
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                Q9SPM0;
Q9SPM0;
01-MAY-2000
PRINTERPRO: IFRO 2270;
PRINTS; PRO1217; PRICHEXTENSN.
PROSITE; PS00172; XYLOSE_ISOMERASE_1; UNKNOWN_1.
PROSITE; PS00172; XYLOSE_ISOMERASE_1; UNKNOWN_1.
                                                                                                                                                                                                                                                      01-MAY-2000 (TrEMBLrel. 13, 01-MAY-2000 (TrEMBLrel. 13, 01-JUN-2000 (TrEMBLrel. 14, EXTENSIN-LIKE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gibbs R.A., Myers E.W., Rubin G.M., Venter J.C.; "The genome sequence of Drosophila melanogaster."; Science 287:2185-2195(2000).
EMBL; AE003481; AAF47902.1; -.
FLYBASE; FBG0035544; CG15021.
                                                                           Hohorst D., Gao M., Showalter A., Bedinger P.A.; "Pollen Extensin-like (Pex) Genes in a Monocot a Submitted (JUN-1999) to the EMBL/GenBank/DDBJ da EMBL; AF159297; AAD55980.1; -.
                                                                                                                                                                                    Eukaryota; Viridiplantae; I Magnoliophyta; Liliopsida; NCBI_TaxID=4577;
                                                                                                                  Stratford S., Barnes Hohorst D., Gao M., S
                                                                                                                                                                                                                              Zea mays (Maize).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INTERPRO: IPRO02965; -.
INTERPRO: IPRO02966; -ROUNTERPRO: IPRO1207; PRICHEXTENSN.
PRINTS; PRO1218; PSTLEXTENSIN
                                                 INTERPRO; IPR001998; -.
                                                                                                                                              TISSUE=POLLEN;
                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                            404
                                                                                                                                                                                                                                                                                                                                                                                                                       340
                                                                                                                                                                                                                                                                                                                                                                                                                                                353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Match
Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7
                                                                                                                                                                                                                                                                                                                                                                                            RPPAPPAPTPEYGPPP---
                                                                                                                                                                                                                                                                                                                                                                                                                 ---APLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                             TYQPRPPAPPAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPAPP----MPPAPNSPAAPPSP--SPPVPVF-PTPPGPPAPPENSSPPAPPAPPAPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PAPPAPPSPINPPV--PPVPPLPAAPRTLSPPVPPAPPSPISLAAPP--LPPDPPMPPAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LPGPSPPAPPAPPLPNSPAAPPGPPAWPGAPDPPAPPLP--YSSPPAPPACPVPG----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----APAPSYGPPQPQPP----APQPPSPPSPQPGPEYLPPDQPKPRPTPSRPQPPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MPALPPAP----PAPPSPPTSWLAVPVPPVPPVP-PLPVKMPPSPPVPPFPPAEPETPNPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WSALEAPNPPVPPAP---PGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PAPSAPAPSYGPPQTRPPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPRPQPTPGYGPPPPPPRPPRPQPTPGYGPPTPPPGP-----GPAQPAPQPPRPQPPRPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPAPPLENSPPPPPVPPVPPPLTLNPPVPPAPPAANTSNSPLRP-PAPPAP-PLKPG '233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---TPSAPAPPPPSYGPPQTPPPRPPPQPTPSAPAPPPSYGPPQTPPPRPPPQPTPS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPRPQPGSEYLPPPGENEVTPTQPQPTAPVPEYGPPPPAPPAGPTYQPRPPAPPAPAPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            446
                                                                                                                                                                                                                                                                                                                           PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AA;
                                                                                                                                  Σ.
                                                                                                                                                                                                                                                                                                                                                                                                                                               -----APGPTYQPRPPSPPAPPAPTYQPQPPAPPA-PAPGPTYQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            45728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29
39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . 48;
                                                                                                                                  Golubiewski A.,
                                                                                                                                                                                                    Embryophyta; Tracheophyta; ; Poales; Poaceae; Zea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ------PPPQPTPPAPRPSYGPPQTQPPRPPPQP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 652.5; 1
Pred. No. 6.7e
14; Mismatches
                                                                                                                                                                                                                                                                     Last sequence up
                                                                                                                                                                                                                                                                                                Created)
                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A2C9CE02A07F0542 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                            PTSGGDEAGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . No. 6.7e-
                                                                                                      a Monocot and a Dicot.";
                                                                                                                               Cotter R., McCormick
                                                                                                                                                                                                                                                                                                                           ΑA
                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DΒ
                                                                                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                                                                                                                                                                      374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          143;
                                                                                           databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                Spermatophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          83;
                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        292
```

```
RESULT
Q65553
ID Q4
AC Q4
DT 00
DT 00
δõ
                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q_{\mathbf{y}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QУ
                                                                                                                                                                                                                                                                                                                                                                             뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 172;
                                                                                                                                                                                                                                                                         Q65553;
Q65553;
01-NOV-1996
01-NOV-1996
01-OCT-2000
                                                                                                                                                                                                            Ul.3b.
Bovine herpesvirus 1.
Viruses; dsDNA viruses, no RNA stage;
Viruses; dsVirinae; Varicellovirus.
                                                                 Vet.
                                                                        Schwyzer M., Styger D., Vogt B. LaBoissiere S., Misra V., Vlcek Vet. Microbiol. 0:0-0(1996).
                                                                                                                                                    Schwyzer M., Vlcek C., Thiry E., Paces V.;
                                                                                                                                                                                                          Alphaherpesvirinae;
NCBI_TaxID=10320;
                                                                                                         STRAIN=COOPER;
                                                                                                                     SEQUENCE OF 1-179
                                                                                                                                            Submitted
                                                                                                                                                                          STRAIN-COOPER;
                                                                                                                                                                                     SEQUENCE FROM N.A.
SEQUENCE OF 1-179 FROM
                     Submitted
                                Schwyzer M.
                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                             885
                                                                                                                                                                                                                                                                                                                                                                                                   376
                                                                                                                                                                                                                                                                                                                                                                                                                                            322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    605
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2 SMPVPPAPPAP------PSPINPPVP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TLPPPSKSSPPEEPVSSPPQAPKSSSPPAPVSSPPPLKSSPPPVPESSPPPTPKSSPPLA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LAYAPAPA
: : | ||
                                                                                                                                                                                                                                                                                                                                                                                                                       PPLAPVSSPPQVEKTSPPPAPVSSPPLEPKP
                                                                                                                                                                                                                                                                                                                                                                                                                                           PPL-PYSSPP-----APPACPVPGAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAASA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --MPPAPNSP-----AAPPGSPP----SPPVPVFPTPGGPPAPPE-PNSGPAAPP---AAPPAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KSTPPPEEEKPTPPTPVKSSPPPEKSLP--PPTLTTSPPPQEKPTPPSTPSKPPPPSPVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PLKSPPPPVLWLSTPSVKSPP-PPVPVASPP-PPVKSPPPLAPVSSPSPPVKLPPLPAPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EAPVSSPQPQVKSPPPPAPVASPPPPMKSPPPPARVASPPPLMKSPPPPAP---VASPPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PGPNSAPAP----PMPPTPPLPPVPPGSGAPRP---VPAVPPM-----PPAPKRMPALPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SPPGTSPPASRGAPPLQAQPPAASSPPATPVKSSPPPAAVVLPPPAKTPSPPAPVASPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APRTLSPP----VPPAPPSPISLAAPPLPPDPPMPPAIWSAL----EAPNPPVP----PAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVPGKPAAPAPMPTPHTPPDVSPEPLPEPSPVPAPAPMRMPTLRSPPADEYIPTPPVPAK
                                                                                                                                                                                                                                                                                                                                                                            VKSSPPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PVSSPPQVEKTSPPPAPVSSPPPTPKSSPPLAPVSSPPQVEKTSPPPAPVSSPPPTPKSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PLPGP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEP-ETPNPPA--PPAP-PL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                         (AUG-1996)
                    (AUG-1996) to
                                                                                                                                                                                                                                                                         (TrEMBLrel. 01, (TrEMBLrel. 15, (TrEMBLrel. 15,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                            892
                                                                                                                                                                                                                                                                                                                                                                                                   383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPPAPPAPPLPNSPAAPP-----
                                                                                                                      FROM
                                                                                                                                         ţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29.1%;
35.2%;
                                                                                                                      N.A.
                                                                                                                                                               Lowery D.
                   the
                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  42;
                                                                                                                                                                                                                                                                       Created)
Last sequence update)
Last annotation update)
                    EMBL/GenBank/DDBJ
                                                                                                                                         EMBL/GenBank/DDBJ
                                                                                                в.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. 4.8e
2; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 645.5; DB 1
Pred. No. 4.8e-39;
                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                               .
[7]
                                                                                      O
                                                                                      Lowery D.
                                                                                                                                                                                                                                                                                                                       3247
                                                                                                                                                               Bello
                                                                                                                                                                                                                                Herpesviridae;
                                                                                      ..
∀.:
                                                                                                                                                               L.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  145;
                    databases
                                                                                                                                         databases
                                                                                                Simard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -GPPAWPGAPDPP----A
                                                                                                                                                               Meyer G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                        SSPPSSVSSPPTT
                                                                                           С.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----PVPPLPA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1315;
                                                                                                                                                               Misra
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     126
                                                                                                                                                                                                                                                                                                                                                                                                                        884
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  840
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             780
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  28;
```

RESULT
Q9N1D1
ID Q9
AC Q9
DT 01
DT 01

ع

Q9N1D1 Q9N1D1; 01-OCT-2000 01-OCT-2000

(TrEMBLrel.

15, 15,

Created) Last sequence PRELIMINARY;

998

A

```
Qγ
                                               Ъ
                                                                    δÃ
                                                                                               B
                                                                                                                     γ
                                                                                                                                              밁
                                                                                                                                                                   Qγ
                                                                                                                                                                                              В
                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                   QY
                                                                                                                                                                                                                                                                                                ₽
                                                                                                                                                                                                                                                                                                                      QУ
                                                                                                                                                                                                                                                                                                                                               ₽
                                                                                                                                                                                                                                                                                                                                                                     20
                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN-JURA;
MEDLINE-97164286; PubMed-9010999;
Schwyzer M., Styger D., Vogt B., Lowery D.
LaBoissiere S., Misra V., Vlcek C., Paces
"Gene contents in a 31-kb segment at the 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (SEP-1997) to the EMBL; 278205; CAB01605.1; -. EMBL; AJ7004801; CAA06097.1; SEQUENCE 3247 AA; 332190
 3119
                                                                                                3008
                                                                                                                                                                                                                                                2830
                                                                                                                                                                                                                                                                                                                                               2710
                                                                                                                                                                                                                                                                                                                                                                                                2650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Schwyzer M., Vlcek C., I
Submitted (NOV-1997) to
                                                                                                                                                                                                                                                                                                                                                                                                                                                2593 SMPAALPWRRPPPASLVSAAPPVPPGPRLPPAPPLPP-PAPP--LPPPAPPLPPPAPPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Schwyzer M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-JURA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=JURA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Vet. Microbiol. 53:67-77(1996).
[5]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   [6]
                        359
                                                                                                                                                                                                                                                                                                                                                                                                                         47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N
                                                            P--APPACPVP-GAPL-APLP-----ISGR-----
                                                                                                                                                                                                                                                                                                                                                                      APRPVPAVPPMP-PAPKRMPALPPAPPAPPSPP--
                                                                                                                                                                                                                                                                                                                                                                                                                       LAAPPLPPD-PPMPPAIWSALEAPNPPVPPAPPGPNSAPAP-PMP-PTPPLP-PVPPGSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                               SMPV-----PP-----APPAPPSPINPPVPPVPPVPPLPAAPRTLSPPVPPAPP--SPIS
                        FTMLSRPSNG-----AAAAASALAYAPAP
                                                                                                NSSPPAPP-APPAAPLPGPSPPAPP-APPLPNSPAAPP-GPPAWPGAPDPPAPPLPYSSP
                                                                                                                                                                                               {\tt AVQSGSKI--PAPSNALVGQVAPALLRRGPSPRGKPGAPARPTGGANIARKNTRAVDPTV}
                                                                                                                                                                                                                      ANTSNSPLRPPAP----
                                                                                                                                                                                                                                               VDAPAPPPAPERPAPPPAPERPAPPPAPERPAPPPAPERPAPPPAPERPAT
                                                                                                                                                                                                                                                                                                PRQRLLRSRSPASVPAPGSELVPPPSGGALGSPPSFVPSRPPSLEPVPGLPLPPSRVQAP
                                                                                                                                                                                                                                                                                                                                               VPAPVPAPAPIPAPAPTPAPAPTPAPPLPPPAPDGAMGALSATRRPTRRAGARKSLPAAQ
                                                                                                                                                                                                                                                                                                                                                                                                PPAPPLPPPAPPLPPPAPSTAPVPAPPLPPPALTPALTPAPTPAPTPAPPLPLPAPITVL
                                                PPIAPPATPAPLIAPLAAPVPRLVGAAARGRVIGHMRAAAPKPRGLRAAERPPMRSWA--
                                                                                                                                                IGSGSALSGLGSAEEDADFGASGMYVAPPGPAPLAAPPAPSALPAPRLEAPAAASLPAPP
                                                                                                                                                                                                                                                                                                                        ----TSWLAVPVP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  195;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                      PSPPVPPPPPAEDETPNPPAPPAPPLENSPPPPPVPPV-PPVPPLTLNPPVPPAPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
SRGNLHTQDLLASAEARICELPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Lowery D.E., Bello L.J. the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 642.5; I
Pred. No. 1.6e
20; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL/GenBank/DDBJ
                                                                                                                                                            MPPAPNSPAAPPSPPSPPVPVFPTPPGPPAPPEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3AEAA72F8F001F6A
                                                                                                                                                                                                                      -PAPPLKPGPPAPP---
                        382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .6e-38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    D.E.,
s V.;
left
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 12;
                                                                                                                                                                                                                                                                                                                        ----PVP--PVPPLPVKMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ., Meyer G
databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Simard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    end
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of
                                                                      PSNSWVGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               211;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misra
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    bovine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ۲
;;
                                                                                                                                                                                                                                                                                                                                                                                                2709
                                                                                                                                                                                                                                                                                                                                                                                                                                                2649
                                                                                                3060
                                                                                                                                                 3007
                                                                                                                                                                                               2947
                                                                                                                                                                                                                                                2889
                                                                                                                                                                                                                                                                       212
                                                                                                                                                                                                                                                                                                 2829
                                                                                                                                                                                                                                                                                                                        156
                                                                                                                                                                                                                                                                                                                                               2769
                                                                                                                                                                                                                                                                                                                                                                                                                         102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        46
                                                                        358
                                                                                                                                                                        272
                                                                                                                                                                                                                         238
                                                                                                                                                                                                                                                                                                                                                                        134
                                                                                                                        329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 31;
```

29;

```
RESULT
OPLING
I
D
D
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T
O
D
T

                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Ma
Best Loc
Matches
                                                                                                                                                                              Q9LMQ1;
01-OCT-2000 (TrEMBLrel. 15, C
01-OCT-2000 (TrEMBLrel. 15, L
01-OCT-2000 (TrEMBLrel. 15, I
F7H2.17 PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
SEQUENCE FROM N.A.
MEDLINE=20018178; PubMed=10548728;
Madeyski K., Lidberg U., Bjursell G., Ni)
"Characterization of the gorilla carboxy
"Characterization of the ster lipase
                                                                                    Eukaryota; Viridiplantae; Embr
Magnoliophyta; eudicotyledons;
Brassicales; Brassicaceae; Ara
    STRAIN-CV.
                         SEQUENCE
                                                                  NCBI_TaxID=3702;
                                                                                                                                                         Arabidopsis
                                                                                                                                                                                                                                                                                                              Q9LMQ1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; AF2
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gorilla gorilla (gorilla).
Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Primates;
NCBI_TaxID=9593;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-OCT-2000 (TrEMBLrel. CARBOXYL-ESTER LIPASE.
                                                                                                                                                                                                                                                                                                                                                                                                                            966
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           678
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 790
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              y Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    92
                                                                                                                                                                                                                                                                                                                                                            10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VPPTGDSGAPPVPPTGDS-GAPPVPPTGDSGAPPVPPTGDSGAPPVPPTGDSGAPPVPPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  239:273-282(1999).
; AF206618; AAF71700.1;
ENCE 998 AA; 101025 I
                                                                                                                                                                                                                                                                                                                                                                                                                            GAPPVPPTGDSEAAPVPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GDSGAPPVPPTGDSGAPPVPTGDSGAPPVPTGDSGAPPVPLTGDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----APPAAPL-PGPSPPAPP----APPLPNSPAAPPGPPAWPGAPDPPAPPLPYS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LKP--GPPAPPMPPAPNSPAAPPSPP-----SPPVPVFPTPPGPPAPPEPNS-SPPAPP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVPP----APPAPPSDIN--PPVPP-----VPPLPAAPRTLSPPVPP-----APPSPIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -SPPAPPACPVPGAPLAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAPPVPPTGDSGAPPVPPTGDSGAPPVPPTGDSGAPPVPPTGDSG-APPVPPTGDSGAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAPPVPPTGDSGAPPVPPTGDSGAPPVPP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      --LAAPPLPPD-----PPMPPAIWSALEAPNPPVPP-----APPGP--NSAPAPPMPPT-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PVPPTGASEAPPVPPTGDSGAPPVPPTGDSGAPPVPPTGDSGAPPVPPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPPPVPP-----VPPVPPL--TLNPPVPP-----APPAANTSNSPLRPPAPP-----APP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GDSGAPPVPPTGDSGAPPVPP----TGDSGAPPVPPTGDSGAPPVPATGDSGAPPVPPTG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -AVPVPP-----VPPVPPL-PVKMPPSPP-----VPPFPPAEPETPNPPAPPAPPLENSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DSGAPPVPPTGDSGAP-PVPPTGDSGAPPVPPTGD--SGAPPVPPTGDSGAPPVPPTGDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -PPLPPVPP--GSGAPRPVP----AVPPMPPAPKRMPALPPAPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
  FROM N.A.
V. COLUMBIA;
                                                                                                                                                         thaliana
                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28.8%;
                                                                                                                                                         (Mouse-ear
                                                                                                                                                                                                                                                                                                                                                                                                                            983
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          15,
                                                                                                           se-ear cress).
Embryophyta; Trachedons; core eudicots;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MW;
                                                                                         Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 638.3; Pred. No. 1.2e-29; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last
                                                                                                                                                                                                                                                                  Created)
                                                                                                                                                                                                                         Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Craniata; Vertebrata; Catarrhini; Hominidae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3C81AD44504E8ABA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       carboxyl ester lipase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          annotation
                                                                                                                                                                                                                                                                                                                1006
                                                                                                           Tracheophyta; S
dicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pseudogene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ..2e-
                                                                                                                                                                                                                                                                                                                ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ertebrata; Euteleostomi; Hominidae; Gorilla.
                                                                                                                                                                                                                                              update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         115;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          update)
                                                                                                                                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -TGDSGAPPVPPTGDS-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       during
                                                                                                           Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -APPSPPTSWL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            locus,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       primate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        907
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             848
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    789
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         35;
```

```
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUAT
Q9EQUA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RA
RA
RA
RA
RA
RT
RT
RT
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                        Q9ZQIO
Q9ZQIO;
01-MAY-1999
01-MAY-1999
01-JUN-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Liu S.X., Sakano H., Yu G., Etgu P., Lee J., Lenz C., Pham P., Toriumi M., Chan A., Chung M., Goldsmith A., Liu A., Smith A., Vaysberg M., Altafi H., Brooks S., Buehler E., Chao Q., Conn L. Conway A.B., Hansen N.F., Johnson-Hopson C., Khan S., Kim C., L. Miranda M., Nguyen M., Palm C.J., Shinn P., Southwick A., Davis Ecker J.R., Federspiel N.A., Theologis A.;

"The sequence of BAC F712 from Arabidopsis thaliana chromosome submitted (JUL-2000) to the EMBL/GenBank/DDBJ databases.

EMBL; AC034256; AAF82153.1; -.

SEQUENCE 1006 AA; 103943 MW; C9FB49F9930C238D CRC64;
     STRAIN=CV. COLUMBIA;
Lin X., Kaul S., Shea T.P.,
Barnstead M.E., Mason T.M.,
Carrera A.J., Creasy T.H., I
                                                                                                                                                                                                             Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; S
Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
                                                                                                                                                                                                                                                                                        PUTATIVE PROLINE-RICH F12K2.4.
                                                                                                          SEQUENCE FROM N.A
                                                                                                                                                                                     Brassicales;
                                                                                                                                                                NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
les 176; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GTTDSPPPPLLGSGAPGITGSPPPPLLGGGAPGITGSPPPPLLGGGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAPDPPAPPLPYS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TPVPCSPPPPPPPPPPPSPPPPPPPPPQPCITCVTAPAPPPPQPCITCVIAPASPPPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PVPPAPPAP---PSP-INPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PVP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   - dd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAIWSALEAPNPPVP------PAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRPPPRPRPRPRPSPRLPPPLVPSPPPPLHPRP-SPCPPPLMPSP-----PPLVPSPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PSPVLPLPPPSAPLPPPLSSSLPSPPLPLVLSPPPPLPGGTVSQPPFTMTPPPLLGGGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PCITCVAAPEPPPPQPCITCIPAPASPPPVPPVIPFVPTPIFILPPLPPLFPVLPPPSVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PCPQNPFLPPPATLPPPLPLPP-PPSLPVTPCSPPPPPIIVNGAPPPPCVTCVQVSPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NPHNSHRHRDENKKGLDRRNRRVKSRRRSRSRNGEAFSTRCDVFFRCIFGTCGQWNFPID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPPPFGDETPPVFSLPPPLDEFPPMPPITWLPPPDVPAQTSSAEAFDQIPPLVTITEAIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PMPPAPKRMPAL - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SSPPAPPAPPAAPLPG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SPL-VPSPPPPSPPPFFFFPSPPPPVIVFPPPLVPSPP-PPLPGGDQTTQPPPLWL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ------PPPVPPVP-PVPPLTLNPPVPPAPPAANTSNSPLRPP------
                                                                                                                                                                                                                                                                                                                                        (TrEMBLrel. 10, Created)
(TrEMBLrel. 10, Last sequence up
(TrEMBLrel. 14, Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                     Brassicaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -PLPVKMPPSPPVPPFPPAEPETP-NPPAPP----APP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               27.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -SPPAP----PACPVPGAPLAPLPISGRP
     Bowman C.L., Shen M.,
Bowman C.L., Ronning
Buell C.R., Town C.D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PSPPAP----PAPPLPNSPAAPP----GPP----AWP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 605.5;
Pred. No. 2.9e
26; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      761
        Ronning own C.D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9e-36;
                                                                                                                                                                                                                                                                                                                                                                   update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    135;
y VanAken S.E.,
ug C.M., Benito M.
wierman W.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                Spermatophyta;
e; eurosids II;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          mith A.,
, Conn L.,
Kim C., Lam B.
A., Davis R.W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -LENSPP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -APPAPPLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1006;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ٩٧٩-
                                  .
Σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1.",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               447
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    59
```

```
RESULT

1D QSPALT

AC QC

AC QC

DT 0

DT 0

DT 0

DT 0

OC 0

OC 0

OC 0

OC 0

OC 0

RRN

RRN

RRA

RRA

RRA

RRA
                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                              Qγ
                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                       Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query
Best I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                      Q9SPM1 PRELIMINARY;
Q9SPM1;
01-MAY-2000 (TrEMBLrel. 1
01-MAY-2000 (TrEMBLrel. 1
01-JUN-2000 (TrEMBLrel. 1
EXTENSIN-LIKE PROTEIN.
                                                                      Lycopersicon esculentum (Tomato).
Eukaryota; Viridiplantae; Embryophyta;
Magnoliophyta; eudicotyledons; core euc
Solanales; Solanaceae. ° ° '
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRINTS; PR00211; GLUTELIN.
PRINTS; PR01217; PRICHEXTENSN.
PRINTS; PR01218; PSTLEXTENSIN.
PRINTS; PR01222; ATROPHIN.
SEQUENCE 761 AA; 81946 MW;
Stratford S., Barnes W., Gol
Hohorst D., Gao M., Showalte
"Pollen Extensin-like (Pex)
Submitted (JUN-1999) to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Arabidopsis thaliana chromosome Submitted (JUL-1999) to the EMBL; AC006233; AAD41992.1; -.
                                     TISSUE=POLLEN;
                                                                 NCBI_TaxID-4081;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INTERPRO; IPR002966; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTERPRO;
                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                   740
                                                                                                                                                                                                                                    347
                                                                                                                                                                                                                                                       680
                                                                                                                                                                                                                                                                                            620
                                                                                                                                                                                                                                                                                                            246
                                                                                                                                                                                                                                                                                                                               562
                                                                                                                                                                                                                                                                                                                                                  196
                                                                                                                                                                                                                                                                                                                                                                    504
                                                                                                                                                                                                                                                                                                                                                                                     149
                                                                                                                                                                                                                                                                                                                                                                                                        445
                                                                                                                                                                                                                                                                                                                                                                                                                         104
                                                                                                                                                                                                                                                                                                                                                                                                                                             392
                                                                                                                                                                                                                                                                         292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 333
                                                                                                                                                                                                                                                                                                                                                                                                                                                               53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local
                                                                                                                                                                                        12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Match
                                                                                                                                                                                                                   PQG 742
                                                                                                                                                                                                                                     ISG
                                                                                                                                                                                                                                                                                                                                                                   QKPPTPTYSPPI-----KPPPLQKPPTPTYSPPIKLPPVKPPTPIYSPPVKPPPVKPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPAPP-APPLPNSPA-APPGPPAWPGAPDPP--APPLP-YSSPPAPPACPVPGAPLAPLP
                                                                                                                                                                                                                                                                                          PIKPPPVHKPPTPTYSPPIKPPPVHKPPTPTYSPPIKPPPVQKPPTPTYSPPVKPPPVQL
                                                                                                                                                                                                                                                                                                       PAAPPSPPSPPVPVFPTPPGPP---APPEPNSSPPAPP-----APPAAPLPGPS
                                                                                                                                                                                                                                                                                                                               PTP--TYSPIKPPPVHKPPTPTYSPIKPPVHKPPTPTYSPIKPPPVHKPPTPTYSP
                                                                                                                                                                                                                                                                                                                                          PVPPLTLNPPVPPAP---PAANTSNSPLRPP----APP----APPLKPGPPAPPMPPAPNS
                                                                                                                                                                                                                                                                                                                                                                                                                         PRPVPAVPPMPPAPKRMPAL----PPAPPAPPSPPTSWLAVPV--PPV------PPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                              --PPDPPMPPAIWSALEAPNPPVPPAPPGPNSAP---APPMPPTPPL--PPV--PPGSGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SPPIKPPPVKPPTPIYSPPVKP-PPVHKPPTPIYSPPVKPPPVHKPPTPIYSPPVKPPPI
                                                                                                                                                                                                                                                       PPTPTYSPPVKPPPVQVPPTPTYSPPVKPPPVQVPPTPTYSPPIKPPPVQVPPTPTTPSP
                                                                                                                                                                                                                                                                                                                                                                                                       PTPIYS-PPVKPPPVHKPPTPTYSPPIKPPPVKPPTPTYSPPVQPPPVQKPPTPTYSPPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                     349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IPR000480;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IPR002951;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                     PRELIMINARY;
S W., Golubiewski A., Cotter R., Showalter A., Bedinger P.A., ke (Pex) Genes in a Monocot and a to the EMBL/GenBank/DDBJ databa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27.1%;
37.8%;
                                                                                                                                13,
13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    35;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 600; DB Pred. No. 5.8e 35; Mismatches
                                                                                                                               Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           osome II BAC F12K2
EMBL/GenBank/DDBJ
                                                                                                                                                   Created)
                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   46438B5AC736DF6C
                                                                                   eudicots;
                                                                                                                                                                     711
                                                                                          Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB 10;
.8e-36;
                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genomic sequence. databases.
                                                                                   Asteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
         Ø
          Dicot.
                                                                                            Spermatophyta;
                                                                                   euasterids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    88;
                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                391
                                                                                                                                                                                                                                                                                          679
                                                                                                                                                                                                                                                                                                            291
                                                                                                                                                                                                                                                                                                                               619
                                                                                                                                                                                                                                                                                                                                               245
                                                                                                                                                                                                                                                                                                                                                                    561
                                                                                                                                                                                                                                                                                                                                                                                                       503
                                                                                                                                                                                                                                                                                                                                                                                                                         148
                                                                                                                                                                                                                                                                                                                                                                                                                                            444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   52
                                                                                   H;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     31;
Qy
                                                                                                                                                                                                                                                                                                                                                                                             ₽
                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               QУ
                                                                                                                                                                                                                                                                                                                               RESULT
                                                                                                                                                                                                                                                                                                                                                          日
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                            Q9SN46
                                                                                                                                                                                                                                                                                                                                                         663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               401
                                                                                                                                                                                                                                                                                                                                                                            291
                                                                                                                                                                                                                                                                                                                                                                                              607
                                                                                                                                                                                                                                                                                                                                                                                                                237
                                                                                                                                                                                                                                                                                                                                                                                                                                  558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       511
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6
```

```
DR
DR
DR
DR
SQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9SN46;
01-MAY-2000 (TrEMBLrel. 1
01-MAY-2000 (TrEMBLrel. 1
01-OCT-2000 (TrEMBLrel. 1
EXTENSIA-LIKE PROTEIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; AF159296; AAD55979.1; -.
INTERPRO; IPRO02965; -.
INTERPRO; IPRO02966; -.
PRINTS; PR01217; PRICHEXTENSN.
PRINTS; PR01218; PSTLEXTENSIN.
             EU Arabidopsis sequencing project; Submitted (MAR-2000) to the EMBL/G EMBL; AL035526; CAB37452.1; -. EMBL; AL161549; CAB78869.1; -.
                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.

Bevan M., Mueller M.W., Muendlein A., Felber R.,
Mewes H.W., Mayer K.F.X., Lemcke K., Schueller C.
Submitted (FEB-1999) to the EMBL/GenBank/DDBJ dat
                                                                                                                                                                                                                                                                                                                                                                                                                      Arabidopsis thaliana (Mouse-ear cress).
Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spermatophyta;
Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II;
                                                                                                                                              Mueller M.W.,
Mayer K.F.X.;
INTERPRO;
                                                                                           SEQUENCE FROM N.A.
                                                                                                                               Submitted
                                                                                                                                                                                    SEQUENCE FROM
                                                                                                                                                                                                                        Submitted
                                                                                                                                                                                                                                         EU Arabidopsis
                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                      Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                F28A21.80 OR AT4G18670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VESPPPPVHSPPPPAPVMSPPPPTFEDVALPPTLGSLYASPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPMPPAPNSPAAPPSPP----APPVPVFPTPPGPPAPPENSSPP----APPAPPAAPLPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLENSPPPPPVPPVPPV--PPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LPPAPPAPP---SPPTSWLAVPVPPVPPV--PPLPVKMPPSPPVPPFPPAEPETPNPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALEAPNPPVPPAPPGPNSAPAPPM--PPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPA 122
----PPPPVASPPPVHSPPPPPVASPPPPVHSPPPPVHSPP 510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPKTVTPPKPSTPTTPKPNPSPPPPKTLPPPPPKTSPPPPVH--SPPPPPVASPPPPVHS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPAPPAPPSPINPPVPPVPPLPAAPRTLSPPVP-PAPPSPISLAAPPLPPDPPMPPAIWS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPPPVHSPPPPVHSPPPVHSPP----PPVASPPP-----PVHSPPPPPPVASPPPPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SPPAPPAPPLPNSPAAPPGPPAWPGAPDPPAPPLPYSSPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                               (MAR-2000)
                                                                                                                                                                                                                      opsis sequencing project; (SEP-1999) to the EMBL/GenBank/DDBJ
   IPR002951;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   711 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                    N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -PVASPPPPVHSPPPPVASPPPPVHSPPPPVHSPPPPVHSPPPVASPPPAL
                                                                                                                                                               Muendlein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          26.18;
41.08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   75063
                                                                                                                               ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13,
13,
15,
                                                                                                                                                                 Α.,
                                                                                                                               the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 577.5; [
Pred. No. 2.3e:
18; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
Last annotation updat
                                                       EMBL/GenBank/DDBJ
                                                                                                                               EMBL/GenBank/DDBJ
                                                                                                                                                                 Felber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3F2EAF509F40E56D CRC64;
                                                                                                                                                               ₽
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          577.5; DB 1
No. 2.3e-34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         839
                                                                                                                                                                 Mewes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                               H.W.,
                                                       databases
                                                                                                                               databases
                                                                                                                                                                                                                      databases
                                                                                                                                                                                                                                                                                              databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  706
                                                                                                                                                                   Lemcke
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             711;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         55;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16;
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                   δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SQ DR
                                                                                                                                                                                                                                                                                                                                        RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Ma
Best Loc
Matches
                                                                                                                         SEQUENCE FROM N.A.
MEDLIND-96061709; Pubmed-7480331;
Wycoff K.L., Powell P.A., Gonzale
                                                                                                                                                                                           HYDROXYPROLINE-RICH GLYCOPROTEIN PRECURSOR.

Phaseolus vulgaris (Kidney bean) (French bean)

Eukaryota; Viridiplantae; Embryophyta; Tracheophyta;

Magnollophyta; eudicotyledons; core eudicots; Rosidae

Fabales; Fabaceae; Papilionoldeae; Phaseolus
                                                                                                                                                                                                                                                        009083;
01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-JUN-2000 (TrEMBLE 114, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRINTS; F
PRINTS; F
SEQUENCE
                                                                             is superimposed expression.";
 Corbin
              TISSUE-LEAF, AND STEM;
MEDLINE-88142825; Pubm
                                        SEQUENCE OF 5-229 FROM N.A.
                                                                                                                     Dixon R.A.;
                                                                                                                                                                                                                                                                                                                Q09083
                                                                                                       Stress activation
                                                                                                                                                                                                                                                                                                                                                                               830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          536
                                                                                                                                                                                                                                                                                                                                                                                                       326
                                                                                                                                                                                                                                                                                                                                                                                                                                771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                               YASPPPPP
                                                                                                                                                                                                                                                                                                                                                                                                       YSSPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VPPLTLNPPVPPAPPAAN-TSNSPLRPPAPPAP--------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPSPPVPPFPAEPETPNP----PAPPAP-----PLENSPP----PVPPVPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TPGGSPPSSPTTPTPGGSPPSSPTTPTPGGSPPSSPTTPSPGGSPPSPSISPSPPITVPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NSMPVPPAPPAPPS-----
                                                                                                                                                                                                                                                                                                                                                                                                                              PPSPAHYSPPPSPPVYYYNSPPPPPAVHYSPPPPPVIHHSQPPPPPIYEG-PLPPIPGIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSPQPPPPPHYSLPPPTPTYHYISPPPPPTPIHSPPPQSHPPCIEYSPPPPPTVHYNPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --PMPPAPNSPAAPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VPPGSGAPRPVPAVP-PMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PSISPSPPITVPSPPTTPSPGSSP------PSPSIVPSP--PSTTPSPGSPPTSPTTP 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCLPARPAQRSPGQCAAFSSLPPVDCGSFGCGRSTRPPVVVPSPPTTPSPGG----SPPS 425
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HILPSRHRHLLRRKHTIHRNHLHHNPRNLQFTALPLLPLYLTCRHRLNLASPPPPAPYYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPPL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PPSTPTSPGSPPSSPTPSSPIPSSPTPSTPPTPISPGQNSPPIIPSPPFTGPSPPSSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPAPPS-PISLAAPPLPPDPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 al Similarity
150; Conser
                                                                   Physiol.
  U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRO1217; PRICHEXTENSN PRO1222; ATROPHIN. E 839 AA; 90243 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
  Sauer
                                                                                                                                                                                                                                                                                                                PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PPVIPSPPIVGPTPSSP--PPSTPTPGTLLHPHHLLLPQLSHLPHQYLHHRLR
                                                                                                                                                                                                                                                                                                                                                                               837
                                                                                                                                                                                                                                                                                                                                                                                                      333
                                                                 109:41-52(1995).
                                                                                           9
 PubMed=3437892;
r N., Lamb C.J.;
                                                                                         of a bean
a pattern
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             30
30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5.8%;
).7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPPAPPA-----PPLPNSPAAPPGPPAWPGAPDPPAPPLP
                                                                                                                                Gonzales
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -SPPSPPVPVFPTPP-----GPPAPPEPNSSPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 571.5;
Pred. No. 6.9e
6; Mismatches
                                                                                           hydroxyproline-rich of tissue-specific d
                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                0F0F04F22D3D9789
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            571.5; D
                                                                                                                               R.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----PINPPVPPVPPLPAAPRTLSPPV 37
                                                                                                                                                                                                                                                                                                                580
                                                                                                                               Corbin D.R.,
                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB
                                                                                                                                                                                                          ophyta; Spermatophyta; Rosidae; eurosids I;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10;
                                                                                           developmental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CRC64;
                                                                                                       glycoprotein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                Lamb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -KPGPPAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96
                                                                                                                                                                                                                                                                                                                                                                                                                               829
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 22;
```

```
RESULT
Q09082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       рь
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query
Best L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                Q09082
Q09082;
01-NOV-1996 (Tri
01-NOV-1996 (Tri
01-JUN-2000 (Tri
EXTENSIN CLASS )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Signal.
SIGNAL
CHAIN
SEQUENCE
                 SEQUENCE FROM N.A. STRAIN=CV. UC82B; MEDLINE=92385769;
                                                                                                                        Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids Solanales; Solanaceae; Solanum.
                                                                                                                                                                                                                                      TEGI.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Differential regulation of a hydroxyproline-rich glycoprotein family in wounded and infected plants.";

Mol. Cell. Biol. 7,44374,444(1987).

EMBL; U18791; AAA87902.1; -...

EMBL; M18094; AAA33764.1; -...
                                                                                                                NCBI_TaxID=4081;
                                                                                                                                                                                                                                                          (TOM J-10).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MENDEL; 16549; Phavu; 2930; 16549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Y Match
Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VYKYKSPPPPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     L----APLPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPAPPLENSPPPPPV-----PPV-----PPVPPLTLNPPVPPA-----PPAANTSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NSMPVP---PAPP----APPSPINPPVPPV-----PP--LPAAPRTLSPPVPP--APPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PPVYKYKSPPPPYKYPSPPPPPYKYSSPPPPVYKYKSPPPPVYKYKSPPPPYKYPSPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPPVYKYNSPPPPVYKYKSPPPPVYKYKSPPPPPYKYPSPPPPPYKYSSPPPPVKKKSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SPPPPYKYPSPPPPYKYPSPPPPVYKYKSPPPPVYKYKSPPPPYKYPSPPPPPYKYPSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SPLRP---PAPPAPPLK-PGP------PAPPM-----PPAPNSPAAPPSP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VPPVPPVPPLPVKMPPSP---PVPPF-----PPAEP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYYHSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PPVPP--GSGAPRPVPAVPP-----MPPAPKRMPA-----LPPAPPAPPSPPTSWLAVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ISLAAPPLPPDPPMPPAIWSALEAP-NPPVPP----APPGPNSAPAPP----MPPTPPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPPPPPYKYSSPPPPVYKYKSPPPPVYKYKSPPPPVYKYNSPPPPVYKYKSPPPPVYKYN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKNPYKYKSPPPPPYKYKSPPPPYKYP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity 33.8
66; Conservative
Rumeau D.,
                                                                                                                                                                                                                                                                                6 (TrEMBLrel. 01, 06 (TrEMBLrel. 01, 10 (TrEMBLrel. 14, 10 (TREMBLREL WALL FASS I (CELL WALL FASS I (C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28
580 #
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PAPPLPNSPAAPPGPPAWPGAPDPP----APPLP---YSSPPAPPACPVPGAP
                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   347
                      PubMed=1381233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27 P
580 H
66316 MW;
Showalter A.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        25.8%;
33.8%;
                                                                                                                                                                                                                                                                                Created)
Last sequence update)
Last annotation update)
Last annotation update)
HYDROXYPROLINE-RICH GLYCOPROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   POTENTIAL.
HYDROXYPROLINE-RICH
; A97881835DABD4BF (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      571; DB
No. 5.7e-
                                                                                                                                                                                                                                                                                                                                                                                                      388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                152;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GLYCOPROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --ETPNP----P
                                                                                                                                                               euasterids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -PSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                  Ţ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                30;
```

```
Query Match
Best Local Similarity
Matches 149; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        genes.";
Plant Mol. Biol. 20:5-17(1992).
-I- FUNCTION: HAS A SPECIALIZED STRUCTURAL FUNCTION, POSSIBLY IN THE MECHANICAL PEMETRATION OF THE CORTEX AND EPIDERMIS OF THE MAIN ROOT. INVOLVED IN PLANT DEFENSE AGAINST INFECTION.
-I- SUBCELLULAR LOCATION: EXTRACELLULAR MATRIX.
-I- TISSUE SPECIFICITY: STEM.
-I- TISSUE SPECIFICITY: STEM.
-I- INDUCTION: BY WOUNDING AND PATHOGEN INFECTION.
-I- PTM: EXTENSINS CONTAIN A CHARACTERISTIC REPEAT OF THE PENTAPEPTIDE SER-PRO(4). THE PROLINE RESIDUE IS HYDROXYLATED AND THEN
                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                          REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                        REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GLYCOSYLATED,
EMBL; M76670; AAA34163.1; -.
MENDEL; H5648; Lyces;2930;16548.
Repeat; Cell wall; Glycoprotein;
                                                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                   REPEAT
                                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                  REPEAT
                                                                                                                                                                                                                                                                                                                                                              REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Multigene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "Isolation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REPEAT
 230
                      204
                                             171
                                                                   156
                                                                                          123
                                                                                                               96
                                                                                                                                      63
                                                                                                                                                             51
                                                                                                                                                                                    7
                                                                                                                                                                                                 4 PVP-----PAPPAPPSPINPPVPPVP------PLPAAPRTL--SPPVPPAPPSPISLAAP
                                                                                                                                                                               PTPYYYKSPPPPSPKYYYKSPPPPSPKYYYKSPPPPSPKYYYKSPP----PPSPKYYYKS 62
SPPPPSPKYVYKS-----PPPPPPYYYKSPPPPSPSPPPPPYYYKSPPPPSPSPPPPPYYYKS
                     PPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVPVF---
                                                                                                              PVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM
                                                                                                                                      PPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKS
                                                                                                                                                            PLPPDP-----PMPPAIWSALEAPNPPVP-----PAPPGPNSAPAPPMPPTPPL---P
                                            PP-PPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYK
                                                                PPSPPVPPFPPAEPETPNP-----PAPPAPPLENSPPPPPVP-----PVPPVPPLTLN
                                                                                         PPPP---SPKYVYKSPP-PPSPKYVYKSPP----PPSPKYVYKS----PPPPSPKYVYKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       family
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               and characterization
                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                         AA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Glycoprotein;
                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                         43227
                                                                                                                                                                                                                                           25.2%;
36.5%;
                                                                                                                                                                                                                                                                                        MW;
                                                                                                                                                                                                                               27;
                                                                                                                                                                                                                                           Score 558;
Pred. No. 3
                                                                                                                                                                                                                                                                                                   5-P-P-P-S-P-K-Y-V-Y-K.

X 16 AA APPROXIMATE TANDEM REPEATS
5-P-P-P-Y-Y-Y-K-S-P-P-P-P-S-P.
                                                                                                                                                                                                                                                                                         9BA8B54AD8304647 CRC64;
                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         X 12 AA TANDEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Structural
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              two wound-regulated tomato extensin
                                                                                                                                                                                                                                           DB 10;
.5e-33;
                                                                                                                                                                                                                                140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein; Hydroxylation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEATS
                                                                                                                                                                                                                                                     Length 388;
                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                               92;
                                                                                                                                                                                                                              Gaps
                                                                                                               155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  οĘ
                                                                                                                                      122
                                                                                                                                                                                                        50
                     260
                                                                                                                                                             95
                                                                                                                                                                                                                               23;
```

Qγ

В Ωy В Qy

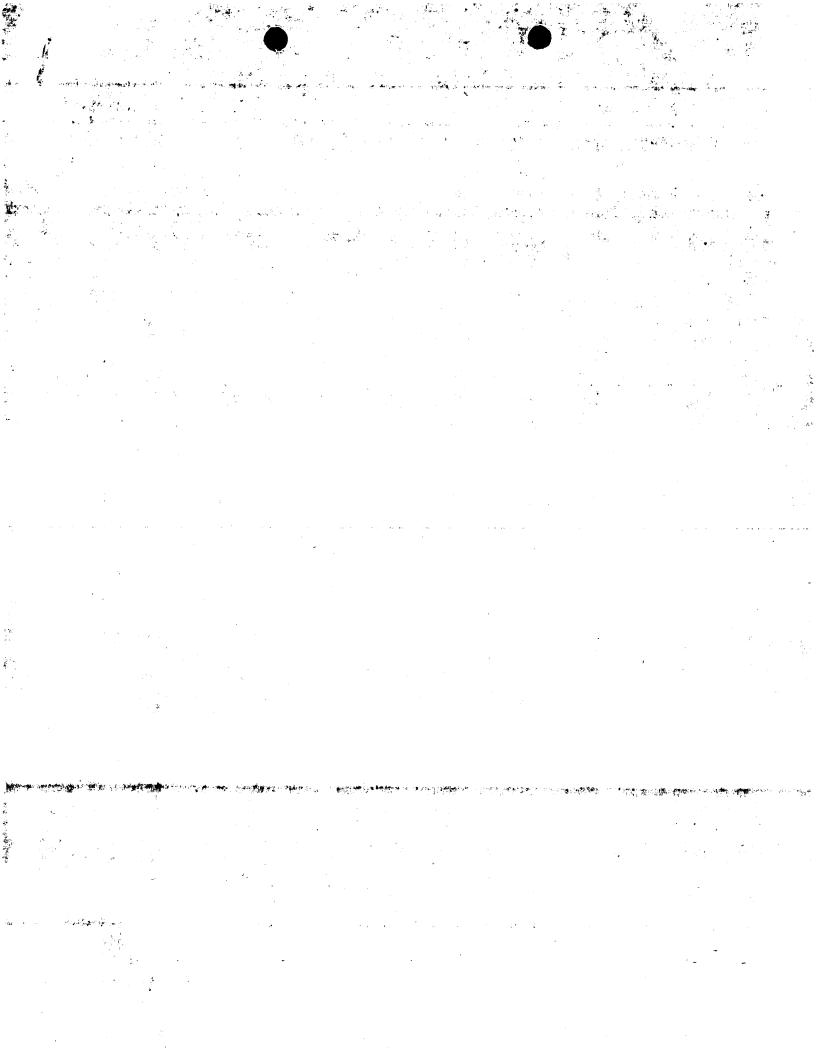
Ωy 밁 Q В

밁

```
δō
  В
                                          В
                                                           QΥ
                     308
                                           285
                                                               261
PGPPAWPGAPDPPA----PPLPYSSPPAPPACPVPGAPLAPLPISGRP
                                                      PTPPGP-PAPPEPNSSPPAP-PAPP-----PAPPLPNSPAAP
                                          PPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKCPPPPSPSPPPPYYYKSPPPPPSPSPP---
                     351
                                                               307
                                           341
```

Search completed: January Job time: 345 sec ū 2001, 14:30:53

ETT DRR KW



```
Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                otal number of hits satisfying chosen parameters:
             Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
             608
511
505
469.55
449.5
439.5
439.5
439.5
439.5
411
411
411
411
411
408.5
408.5
409.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309.5
309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            seq length: 0
seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query
         88757 seqs, 32294092 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SwissProt_39:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-461-774-10
2216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             January 5, 2001, 14:31:21; Search time 35.06 Seconds (without alignments) 355.548 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NSMPVPPAPPAPPSPINPPV..........NGAAAAASALAYAPAPAVKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length
         5179

8179

2985

2985

2985

1183

3466

4267

1664

1185

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2713

2714

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

2715

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GenCore version 4.5 (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DВ
      TEGU_HSV11
DIAL_MOUSE
BAT2_HUMAN
CA1H_HUMAN
CA1H_HOMAE
DIAL_HUMAN
CA1H_MOUSE
MUC1_HUMAN
TEGU_HSVEBB
TA2D3_HUMAN
TA2D3_HUMAN
CA44_HUMAN
CA44_HUMAN
CA44_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                              EXTN TOBAC
VPPL YEAST
MUC2 HUMAN
SP62 MOUSE
PPB3 MOUSE
PPB1 LYCES
EXLP TOBAC
EXTN MAISE
SLP1_CLOTM
SP62 HUMAN
URPL HUMAN
URPL HUMAN
VR75_LUPLU
TNX2-HUMAN
VR75_HUMAN
VR75_HUMAN
VR75_HUMAN
VR75_HUMAN
VR75_HUMAN
VR75_HUMAN
VR75_HUMAN
VR75_HUMAN
VR75_HUMAN
VR71_SCHPO
EXTN_SORBI
EBN2_EBV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       88757
                          p37370 saccharomyc p37370 saccharomyc p26223 mus musculu p5223 mus musculu p54258 rattus norv Q00451 lycopersico Q03211 nicotiana t p14918 zea mays (m Q06852 clostridium Q15428 homo sapien p5425 homo sapien p64280 homo sapien p64280 homo sapien p64280 homo sapien p744152 sorghum bic p12978 epstein-bar p10220 herpes simp p68040 homo sapien p39060 homo sapien p39060 homo sapien p39060 homo sapien p39061 mus musculu p48634 homo sapien p39061 mus musculu p15442 mus musculu p15444 saccharomyc p01246 saccharomyc p01246 homo sapien p159416 saccharomyc p01246 homo sapien p154416 saccharomyc p01246 homo sapien p15442 homo sapien p15446 homo sapien p15446 saccharomyc p01246 homo sapien p15446 homo 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Description
O homo sapien
I mus musculu
2 mus musculu
1 h mucin 1 p
5 equine herp
6 saccharomyc
8 homo sapien
0 homo sapien
0 homo sapien
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nicotiana t
saccharomyc
```

45	44	43	42	41	40	39	38	37	36	Ü	34
345.5	348	348	350.5	353	356.5	357.5	359	362	367.5	372.5	374.5
15.6	15.7	15.7	15.8	15.9	16.1	16.1	16.2	16.3	16.6	16.8	16.9
439	1157	371	1638	534	296	1453	744	3149	680	826	1838
1	_	_	<u>-</u>	_	μ,	<u> </u>	ר	Н	٢	ب	1
XP2_XENLA	SRA4_HUMAN	PRP2_MEDTR	BRM_DROME	APG_ARATH	CC01_CAEEL	CA11_CHICK	CA18_RABIT	TEGU_EBV	CA1A_HUMAN	SSP2_PLAYO	CA15_HUMAN
P17437 :											
xenopus lae	homo sapien	medicago tr	drosophila	arabidopsis	caenorhabdi	gallus gall	oryctolaqus	epstein-bar	homo sapien	plasmodium	homo sapien

ALIGNMENTS

DR KW KW FTT FTT FTT FTT SQ		RESULT EXTN_T ID TENTO AC P AC P DT 0 DT 0 DT 0 DT 0 OC N OC N OC M
EMBL; X13885; PIR; SG0733; SG Repeat; Cell w Hydroxylation. SIGNAL CHAIN REPEAT 7 REPEAT 14 DOMAIN 22 REPEAT 23 DOMAIN 20 DOMAIN 20 DOMAIN 49 DOMAIN 49 DOMAIN 49 DOMAIN 49 DOMAIN 49 DOMAIN 49	SEQUENCE FROM N.A. STRAIN-CV. XANTHI; MEDLINE-90118263; PR KELLET B., Lamb C.J "Specific expression glycoprotein gene in Genes Dev. 3:1639-11 -i-FUNCTION: HAS A THE MECHANICAL -i-FUNCTION: EXTENSINS C-i-PTM: EXTENSINS C-i-PTM: EXTENSINS C-i-PTM: EXTENSINS SER-PRO(4). THE GLYCOSYLATED. This SWISS-PROT enti- between the Swiss the European Bioinfo use by non-profit modified and this si entities requires a or send an email to	, H
CAA32090.1; 106733. Pall; Glycoprotein 1	SEQUENCE FROM N.A. STRAIN-CV. XANTHI; TISSUE-LEAF; MEDLINE-90128263; PubMed=2612909; Keller B., Lamb C.J.; Keller B., Lamb C.J.; Repecific expression of a novel cell wall hydro glycoprotein gene in lateral root initiation."; Genes Dev. 3:1639-1646(1989). 1- FUNCTION: HAS A SPECIALIZED STRUCTURAL FUNC THE MECHANICAL PENETRATION OF THE CORTEX AN MAIN ROOT. 1- SUBCELLULAR LOCATION: EXTRACELLULAR MATRIX. 1- SUBCELLULAR FOOLINE RESIDUE IS HYDROXII SER-PRO(4). THE PROLLINE RESIDUE IS HYDROXII GLYCOSYLATED. This SWISS-PROT entry is copyright. It is produbetween the Swiss Institute of Bioinformatics the European Bioinformatics Institute. There a use by non-profit institutions as long as; modified and this statement is not removed. Use entities requires a license agreement (See http or send an email to license@isb-sib.ch).	STA 0 (Rel. 0 (Rel. 2 (Rel. 2 (Rel. tabacum viridip yta; eud
Structural protein; NDEM REPEATS OF T-H-R- E SER-PRO(4) REPEATS. MATE TANDEM REPEATS. AB28524 CRC64;	TISSUE=LEAF; PubMed=2612909; I.; Of a novel cell wall hydroxyproline-rich in lateral root initiation."; 1646(1989). A SPECIALIZED STRUCTURAL FUNCTION, POSSIBLY IN PENETRATION OF THE CORTEX AND EPIDERMIS OF THE CONTAIN A CHARACTERISTIC REPEAT OF THE PENTAPEPTIDE ON PROLINE RESIDUE IS HYDROXYLATED AND THEN CONTAIN A CHARACTERISTIC REPEAT OF THE PENTAPEPTIDE PROLINE RESIDUE IS HYDROXYLATED AND THEN CONTAIN A CHARACTERISTIC REPEAT OF THE PENTAPEPTIDE PROLINE RESIDUE IS HYDROXYLATED AND THEN contain a collaboration institute of Bioinformatics and the EMBL outstation formatics Institute. There are no restrictions on its institutions as long as its content is in on way statement is not removed Usage by and for commercial license agreement (See http://www.isb-sib.ch/announce/	NDARD; PRT; 620 AA. 13, Created) 13, Last sequence update) 21, Last annotation update) (CELL WALL HYDROXYPROLINE-RICH GLYCOPROTEIN). (Common tobacco). lantae; Embryophyta; Tracheophyta; Spermatophyta; icotyledons; core eudicots; Asteridae; euasterids I; eae; Nicotiana.

Query Match 27.4%; Score 608; DB 1; 1 Best Local Similarity 37.3%; Pred. No. 8.2e-19; Matches 166; Conservative 29; Mismatches 138;

Length 620; Indels 112:

Gaps

29;

```
망
PRINCE OCCUPANTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 2
VRP1_YEAST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VRP1_YEAST STAN
P37370; Q06133;
Q1-QCT-1994 (Rel. :
Q1-NOV-1997 (Rel. :
Q1-NOV-1997 (Rel. :
                                                                                                                                              STRAIN-S288C / AB972:

STRAIN-S288C / AB972:

Johnston M., Andrews S., Brinkman R., Cooper J., Ding H., Du Z.,

Johnston M., Andrews S., Brinkman R., Cooper J., Ding H., Du Z.,

Ravello A., Fulton L., Gattung S., Greco T., Kirsten J.,

Kucaba T., Hallsworth K., Hawkins J., Hillier L., Jier M.,

Johnson D., Johnston L., Langston Y., Latteille P., Le T.,

Johnson D., Johnston L., Haller N., Nhan M., Pauley A., Peluso D.,

Mardis E., Menezes S., Miller N., Nhan M., Pauley A., Peluso D.,

Rifken L., Riles L., Taich A., Trevaskis E., Vignati D.,

Rifken L., Riles L., Taich A., Wilson R., Waterston R.;

Wilcox L., Wohldman P., Vaudin M., Wilson R., Waterston R.;

Submitted (JAN-1995) to the EMBL/GenBank/DDBJ databases Cellular

Submitted (JAN-1995) to the EMBL/GenBank/DDBJ databases Cellular

GROWTH. MAY EXERT ITS EFFECTS ON THE CYTOSKELETON AND CELLULAR

GROWTH. MAY EXERT ITS EFFECTS ON THE CYTOSKELETON DIRECTLY. C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Donnelly S.F.H., Pocklington M.J., Pallota "A proline-rich protein, verprolin, involve organization and cellular growth in the yea cerevisiae.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VRP1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Saccharomyces cerevisiae (Baker's yeast).
Eukaryota; Fungi; Ascomycota; Saccharomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mol. Microbiol. 10:585-596(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=95058201; PubMed=7968536;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Saccharomycetaceae; Saccharomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VERPROLIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          518
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Δ
                                                                                      INDIRECTLY VIA PROLINE-BINDING PROTEINS PROTEINS POSSESSING SH3 DOMAINS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OR MDP2 OR END5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SPPL-PAPP-TYSPPPPTYSPPPPTYAQPPPLPPTYSPPPPAYSPPPPTYSPPPPTYSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RQIHSPP--PPHRQPRPPTPTYGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----APPACPVPGAPLAPLPISGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RQPRPPTPTYGQPPSPPTFSPPPPRQIHSPP-PPHWQPRTPTPTYGQPPSPP-TFSAPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPPAYAQPPPPPPTYSPPPPAYSPPPPSPIYSPPPPQVQPLPPTFSPPPPRRIHLPPPPH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APNSPAAPPSPP---SPPVPVF-PTPPGP---PAPPEPNSSPP--APPAPPAAPLPGP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -PPVPPVPPLTLNPPVPP-APPAANTSNSPLRPP---APPAPPLKPGPP---APPMP---P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SSPIYSPPPPVYSPPPPPSYSPPPPTYLPPPP--PSSPPPPSFSPPPPTYEQSPPPPPAY 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPP--APPAPPLENSPPPPPV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       YSPPPPTYSPPPPSPIYSPPPPAXSPSPPPTPTFTFSPPPPAXSPPPPTXSPPPPTYLPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPPAPPSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PQPPTHRHAPPTHRHAPPTHQPSPLRHLPPSPRRQPQPPTYSPPPPAY - - - AQSPQPSPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PSPPSRHGHPPPPTYAQPPPTPIYSPSPQVQP----PPTYSPPPPTHVQPTPSPPSRGHQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PVPPA-----PAPPS----PAPPSPINPPVPPUPAAPRTLSPPVP-----PAPPS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----SPPAPP--APPLPNSPAAPPGPPAW-PGAP-----DPPAPPLPYSSPP- 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --PISLAAPP-----LPPDP------PMPPAIWSALEAPNPPVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          35,
35,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OR YLR337W OR L8300.13.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
Last sequence up
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pallota D., Orr E.;
involved in cytoskeletal
the yeast Saccharomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       817
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A
                                                                                                                          (E.G. PROFILIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Saccharomycetales;
                                                                                                                             OR
                                                                                                                                                           OR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           43
```

```
SWISS-PROT entry is copyright. It is produced
     the Swiss
     Institute
     of Bioinformatics
    and
through a collaboration the EMBL outstation
               collaboration
                                       γQ
                                                                   В
                                                                                           QΥ
                                                                                                                                              Q
                                                                                                                                                                           В
                                                                                                                                                                                                    Ωy
                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                           ρ
                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                   В
                                                                                                                        밁
                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                         Ωy
                                                                                                                                                                                                                                                                                                                                     Д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                          515
                                                                                                                                                                             455
                   633
                                           324
                                                                    573
                                                                                                306
                                                                                                                                                    289
                                                                                                                                                                                                       283
                                                                                                                                                                                                                                 396
                                                                                                                                                                                                                                                        246
                                                                                                                                                                                                                                                                                 337 NVTSAPKKATSAPAPPPPPLPAAMSSASTNSVKATPVPPTLAPPL-PNTTSVPPNKASSM
                   AASLLHDVLPSSNLEKPPSPPVAAAP--PLPTFSAPSLPQQSVSTSIPSP
                                                                                                                       NVRPSPISPSINPPKQSSQNGMSFLDEIESKLHKQTSSNAFNAPPPHTDAMAPPLP--PS
                                                                                                                                                                                                                                                        PAAPPSPPSPP---
                                                                    APPPPTTSLPTPTASGDDHTNDKSETVLGMKKAKAPALPGHVPPPVPPVLSDDSKNNVP
                                                                                              APPGP----
                                                                                                                                                  ------GPS--PP-----
                                                                                                                                                                             SSKQSKISSSSSSSAVTPGGPLPFLAEIQKKRDDRFVVGGDTGYTTQDKQEDVIGSSKDD
                                                                                                                                                                                                                              PAPPPPPPPPPGAFSTSSALSASSIPLAPLPP-PPPPSVATSVPSAPPPPPTLTTNKPSA
                                                                                                                                                                                                       LPYSSPPAPPACPVPGAPLAPLPISGRPSNSWVGVFTMLSRP
                                                                                                                                                                                                                                                        --VPVFPTPPGPPAPPEPNSSPPAPPAP-----
```

-----PAWPG-APDPPAPP------

680

----APP-----APPLPNSPA

305

514

288

572

323

454

between This

> Que Bes Mat the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch). DOMAIN CONFLICT DOMAIN DOMAIN DOMAIN DOMAIN DOMAIN Cytoskeleton; Repeat EMBL; Z26645; CAA81388.1; -. EMBL; U19028; AAB67263.1; -. SEQUENCE CONFLICT CONFLICT CONFLICT \$39626; \$39626 \$0004329; VRP1 817 239 349 349 349 424 462 704 308 350 689 S39626 AA; 14 245 357 406 431 468 708 308 350 689 82593 ΜŒ,; POLY-PRO.
> POLY-PRO.
> POLY-PRO.
> POLY-PRO.
> POLY-PRO.
> POLY-PRO. 1). ; 24C7522D5B1CA1C8 CRC64; POLY-PRO.
>
> P -> R (IN REF. 1).
>
> A -> R (IN REF. 1).
>
> Y -> E (IN REF. 1).
>
> STMDTGTSNSDSKAKKORLESTGGSTLQHKHNTHTNOPDV DVGKTTGGNSIVGAKKGNERIVIDDSRFKWTNVSOMPKP RPFQNKTKLYPSGKGSSVPLDLTLFT -> HLRWIPVPLLA PVKTLNNGYFLQVDRRCNTSIIRIQINQMLM (IN

ery Match	tch 23.1%; Score 511; DB 1; Length 817;
ches	ches 160; Conservative 32; Mismatches 146; Indels 252; Gaps 24;
2	2 SMPVPPAPPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPDDP 56
117	117 SASAPPIPGAVPSVAAPPIPNAPLSPAPAVPSIPSSSAPPIPDIPSSAAPPIP 169
57	57 PMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVP 108
170	IVPSSPAPPLPLSGASAPKVPQ-NRPHMPSVRPAHRSHQRKSSNISLPSV 218
109	109 AVPPMPPAKRMPALPPAPPAPPAPSWLAVPVPPVPPVPPLPVKMPP 157
219	219 SAPPLPSASLPTHVSNPPQAPPPPPTTTIGLDSKNIKPTDNAVSPPSSEVPAGGLPFLAE 278
158	SPPVPPFPPAEPETPNPPAPPAPPLENSPPPPPVP 192
279	279 INARRSERGAVEGVSSTKIQTENHKSPSQPPLPSSAPPIPTSHAPPLPPTAPPPPSLP 336
193	193 PVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNS 245
2 7	

```
RESULT 3
MUC2_HUMAN STANDARD; PRT; 5179 AA
ID MUC2_HUMAN STANDARD; PRT; 5179 AA
AC Q02817; Q14878;
DT 01-JUN-1994 (Rel. 29, Created)
DT 01-NOV-1997 (Rel. 35, Last sequence update)
DT 15-JUL-1999 (Rel. 38, Last annotation update)
DE MUCIN 2 PRECURSOR (INTESTINAL MUCIN 2).
GN MUC2 OR SMUC.
                                                                                                                                                                                                                                          AGENTS AT MUCOSAL SURFACES.

-!- SUBCUNIT: MULTIMERIC.
-!- SUBCELLULAR LOCATION: SECRETED.
-!- TISSUE SPECIFICITY: COLON, SMALL INTESTINE, COLONIC TUMORS,
BRONCHUS, CERVIX AND GALL BLADDER.
-!- PTM: ALL CYSTEINE RESIDUES ARE INVOLVED IN INTRACHAIN OR
INTERCHAIN DISULFIDE BONDS (BY SIMILARITY).
-!- POLYMORPHISM: THE NUMBER OF REPEATS IS HIGHLY POLYMORPHIC AND
VARIES AMONG DIFFERENT ALLELES.
-!- SIMILARITY: THE N-TERMINAL DOMAIN SHOWS SOME SIMILARITY TO THAT
OF SILKWORM HEMOCYTIN.
-!- SIMILARITY: CONTAINS 2 VWFC DOMAINS.
                                                                                                                                     entities
or send a
                                                                                                                                                                                                          This SWI
                                                                    EMBL;
EMBL;
EMBL;
EMBL;
               INTERPRO; INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                           and polymorphism.";

J. Clin. Invest. 88:1005-1013(1991).

-!- FUNCTION: COATS THE EPITHELIA OF THE INTESTINES, AIRWAYS, FOTHER MUCUS MEMBRANE-CONTAINING ORGANS. THOUGHT TO PROVIDE PROTECTIVE, LUBRICATING BARRIER AGAINST PARTICLES AND INFEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Toribara N.W., Gum J.R. Jr., Culhand Petersen G.M., Kim Y.S.; "MUC-2 human small intestinal mucin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gum J.R. Jr., Hicks J.W., Toribara N. Molecular cloning of human intestina Identification of the amino terminus to prepro-von Willebrand factor.", J. Biol. Chem. 269:2440-2446(1994)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
TISSUE=INTESTINE;
MEDLINE=94132002; PubMed=8300571;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 1343-1895 AND 4176-4195 FROM MEDLINE=91358717; PubMed=1885763;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Homo sapiens (Human).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; I
Mammalia; Eutheria; Primates; Catarrhini; Hominidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "The human MUC2 intestinal mucin has both upstream and downstream of its c J. Biol. Chem. 267:21375-21383(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gum J.R. Jr.,
Kim Y.S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=93016075; PubMed=1400449;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TISSUE-COLON;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                          INTERPRO;
                                                                                                                                                                          s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way by non-profit institutions as long as its content is in no way
                                                                    L21998; AAB95295.1; M74027; AAA59875.1; M94131; AAA59163.1; M94132; AAA59164.1;
                                                        158370;
                                                                                                                                        an
                                                                                                                                    and this statement is not removed. requires a license agreement (See an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OF 626-1895 AND 4196-5179 FROM N.
  IPR000359;
IPR000561;
IPR001007;
IPR001846;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hicks
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ч
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .
V.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Toribara N.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                oribara N.W., Siddiki B., Kim Y.S.; intestinal mucin (MUC2) cDNA. terminus and overall sequence similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Culhane P.J., Lagace R.E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         s cysteine-rich subdomains located central repetitive region.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 update)
                                                                                                                                                    (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              structure. Repeated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Rothe
                                                                                                                                                             Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               E.-M., Lagace
                                                                                                                                                                Ьy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Homo
                                                                                                                                                                and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hicks J.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                              OVIDE A
INFECTIOUS
                                                                                                                                                                for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              arrays
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            :
E.,
                                                                                                                                                                in no way
  CARBOHYD
CARBOHYD
CARBOHYD
                                                                CARBOHYD
CARBOHYD
CARBOHYD
CARBOHYD
                                                                                                                      CARBOHYD
CARBOHYD
CARBOHYD
                                                                                                                                                             CARBOHYD
CARBOHYD
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                CARBOHYD
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                             DISULFID
DISULFID
DISULFID
DISULFID
DISULFID
CARBOHYD
CARBOHYD
 CONFLICT
                                                                                                                                                                                                                    CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                           CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                      CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                        CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Glycoprotein;
SIGNAL
CHAIN 2
                                                                                                                                                                                                                                               CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
REPEAT
REPEAT
REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DOMAIN
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROSITE; PS01022; EGF_1; UNKNOWN_1.
PROSITE; PS01185; CTCK_1; 1.
PROSITE; PS01225; CTCK_2; 1.
PROSITE; PS01208; VWFC; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRINTS; PR00438; GFCYSKNOT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PFAM;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INTERPRO; IPR002400;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PF00007; Cys_knot; PF00094; vwd; 4.
 44422
4438
4502
4616
4627
4752
4787
4881
4881
4885
5038
5038
5038
                                                                                                                                                                                                                    894
1139
1154
1215
1230
1230
1230
1246
1787
1820
4339
43351
4362
4373
                                                                                                                                                                                                                                                                                                                                                                                                                                                    1401
1401
1417
1417
1433
1449
                                                                                                                                                                                                                                                                                                                                                                                   163
423
670
770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Repeat;
1494
1533
1556
1572
1596
1612
1635
1662
1663
1663
1663
1731
1731
1731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Polymorphism; Signal.
0 POTENTIAL.
9 MUCIN 2.
APPROXIMATE REPEATS
                                                              VWEC 1.

VWEC 2.

CTCK.

BY SIMILARITY.
BY SIMILARITY.
BY SIMILARITY.
BY SIMILARITY.
BY SIMILARITY.
BY SIMILARITY.
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (GLCN)
N-LINKED (G
                                      N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4.
5.
6.
7a.
7B.
8a.
8a.
9a.
10a.
11a.
                           N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12.
13.
14.
15.
(IN REF.
                         (GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
(GLCNAC.
                                                                                                                                                                                                                               (GLCNAC
(GLCNAC
(GLCNAC
                                                                                                                                                                                                                                                                                                  (GLCNAC
                                                                                                                                                                                                                                                                                                                             (GLCNAC
                                                                                                                                                                                                                                                                                                                                                                     (GLCNAC
                                                                                                                                                                                                                                                                                                                                                                                                                           (GLCNAC
                                                                                                                                                                                                                                                                                      (GLCNAC
                                                                                                                                                                                                                                                                                                                                                        (GLCNAC
                                                                                                                                                                                                                                                                                                                                                                                                (GLCNAC
                         (POTENTIAL)
(POTENTIAL)
                                                                (POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
(POTENTIAL)
```

[3]

Gum

MIM;

```
RESULT 4
SP62_MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local S
Matches 124
                                                                                                                                                                                                                                                                                                                                                          01-NOV-1997 (Rel. 35, C:
01-NOV-1997 (Rel. 35, La
01-OCT-2000 (Rel. 40, La
SPLICEOSOME ASSOCIATED P
2) (SF3A66).
                This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONFLICT
CONFLICT
CONFLICT
SEQUENCE
between
                                                                                                                                                                                                  Dresser D.W., Hacker A., Lovell-Badge "The genes for a spliceosome protein (hormone (AMH) are contiguous.";
                                                                                                                                                                                                                                                                                                     Mus musculus (Mouse)
Eukaryota; Metazoa; (
Mammalia; Eutheria; I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1628
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1508
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1399
                                                                                                                                                                                                                                              MEDLINE=96081226; PubMed=8541848;
                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                SF3A2 OR SAP62
                                                                                                                                                                                                                                                                                                                                                                                                                                                  SP62_MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4
                                     A. MOI. Genet. 4:1613-1618(1995).

FUNCTION: SUBUNIT OF THE SF3A COMPLEX REQUIRED FOR 'A' COMPLEX ASSEMBLY FORMED BY THE STABLE BINDING OF U2 SNRNP TO THE BRANCHPOINT SEQUENCE (BPS) IN PRE-MRNA. SEQUENCE INDEPENDENT BINDING OF SF3A/SF3B COMPLEX UPSTREAM OF THE BRANCH SITE IS ESSENTIAL, IT MAY ANCHOR U2 SNRNP TO THE PRE-MRNA.

SUBUNIT: SF3A IS COMPOSED OF SAPS 61, 62 AND 114 (SF3A60, SF3A(DAND SF3A120 RESPECTIVELY).

SUBCELLULAR LOCATION: NUCLEAR (POTENTIAL).

TISSUE SPECIFICITY: FOUND IN ALL TISSUES EXAMINED.

SIMILARITY: TO YEAST PRP11.
SWISS-PROT entry is copyright.
een the Swiss Institute of Bio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PSSPITTIPSPPTTTMTTPSPTTTPSSPITTTTTPSSTTTPSSPPPTTMTTPSPTTTPSPP 1740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TTTTPPPTTTPSPPTTTTPSPPTTTTPPPTTTPSPPTTTTTPPPTTTPSPPTTTPIT 1627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVPP-APPAPPSPINPPVPP-VPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPA 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TTTMTTLPPTTTSSPLTTTPLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SS-----PPAPPACPVPGAPLAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPAP----PAPPAAPLPGPSPPAPPAPPL----PNSPAAPPGPPAWPGAPDPPAPPLPY 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PSPPTTTPSPPPTTTTLPPTTTPSPPTTTTTPPPTTTPSPPITTTTPLPTTTPSPPI 1458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPTSTTTLPPTTTPSPPPTTTTPPPTTTPSPPTTTPSPPITTTTPP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPA-----PPAPPLKPGPPAPPMPPAPNSPAAP-PSPPSPPVPVFPTPPGPPAPPEPNSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EPETPNPPAPPAPPLENSPPP-----PVPPVPPVPPLTLNPPVPPAPPAANTSNSPLR 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ITPPASTTTLPPTTTPSPPTTTTTPPPTTTPSPPTTTPITPPTSTTTLPPTTTPSPPPT 1567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ALPPA-----PPAPPSPPTSWLAVPVPPVPPVPP--LPVKMPPS----PP--VPPFPPA 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --STTTTPPPTTTPSP9----PTTSPPT---TPGSPTTTTTTPPPTTTPPPTTTPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMP 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1449
1504
4192
5179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1449
1504
4192
AA; 54
                                                                                                                                                                                                                                                                                                                                                                         35, Created)
35, Last sequence update)
40, Last annotation update
IATED PROTEIN 62 (SAP 62)
                                                                                                                                                                                                                                                                                                      Chordata;
Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 505;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  344
                                                                                                                                                                                                                                                                                                    Craniata; Ver
Sciurognathi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            · · ·
ght. It is produced through Bioinformatics and the EM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          > P (IN REF. 3).
> T (IN REF. 3).
> S (IN REF. 2).
85CD7571FB9A5663 CRC64;
                                                                                                                                                                                                                                                                                                                                                                         cion update)
(SAP 62) (SPLICING FACTOR
                                                                                                                                                                                                                  e R., Guerrier D.;
(SAP62) and the anti-Mullerian
                                                                                                                                                                                                                                                                                                                                                                                                                                                485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      4e-14;
                                                                                                                                                                                                                                                                                                     Vertebrata; l
thi; Muridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 5179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                     Euteleostomi;
; Murinae; Mus
 EMBL
          a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60;
                                                                                                                                                                                                                                                                                                                                                                           3A
 outstation
                                                                                                                                                                                                                                                                                                                                                                            SUBUNIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1507
```

```
B
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 21.2%;
Best Local Similarity 39.4%;
Matches 136; Conservative
                                                                                                                                                                                                                                                                                                                                                                    PRP.
                                                                                                                                                                                                                                                                                                            13-AUG-1987
13-AUG-1987
01-OCT-1994
                                                                                                                                                                                                                         Mus musculus (Mouse).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
DOMAIN
                  or send an email to license@isb-sib.ch).
                                                    use by non-profit institutions as long modified and this statement is not removed
                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on it
                                                                                                                                                                                                                                                                                  PRP.
EMBL; M12100; AAA40005.1;
                                        entities
                                                                                                                                                     mouse multigene family
                                                                                                                                                                                               MEDLINE=86059475; PubMed=2999141;
                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                      P05143;
                                                                                                                                                                                                                                                                                                                                                                   PRP3_MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                   Ann D.K.,
                                                                                                                                                                                                                                                                                               PROLINE-RICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                       446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         69
                                                                                                                                      Biol. Chem. 260:15863-15872(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                European Bioinformatics Institute.
                                                                                                                                                                   structure and organization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                LPNSPAAPPGPPAWPGAPDPP--APPLPYSSP---PAPPACPVPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         processing; mRNA splicing; Nuclear IN 233 236 POLY-PRO. IN 252 256 POLY-PRO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MGI:104912; SF3A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                       QP--PGVHPSNPGVHPAPMPPMLRPPLPSDGPGNMPPPP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --PAPGVHPPAPGV----HPPTP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NSPPPPPVPPVPPVPLTLNPPVPPAPPAPPANTSNSPLRPPAPPAPPLKPG---PPAPPMPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPSAGVHPQAPGVHPPAPAVHPQAPG-VHPPAPGIHPQAPGVHPQPP-PGVHPAAPGVHP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APNSPAAPPSP-PSPPVP-VFPTPPGPPAPPEPNSSPPAPPAPPAAPLPGPSPPAPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APVVHPPTSGVH----PPAPGVHPPAPVVHPPTSGVHPPAPGVHPPTPGVHPPAPGVHP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AP-PSPTSWLAVPVPPVPPV-PPLPVKMPPSPPV-PPFPPAEPETP--NPPAPPAPPLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----PPPPPG--GLPLPPMPPTGPAPSGPPGP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPAPPS-----LPAGPPGVKRPPPPLMNG-----LPPRPPLPDAL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSALEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPP 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               x83733; CAA58703.1; -.
                                       requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                  Carlson D.M.;
                                                                                                                                                                                                                                                                                                          (Rel. 05,
(Rel. 05,
(Rel. 30,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             485 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             479
                                                                                                                                                                                                                                                                                            (Rel. 05, Last sequence update) (Rel. 30, Last annotation updat PROTEIN MP-3 (FRAGMENT).
                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               483
51279
                                                                                                                                                                                                                                                                                                                                         Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 469.5; DB 1;
Pred. No. 2.4e-13;
2; Mismatches 106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POLY-PRO
                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             70D2CAE4FC938458
                                                                                                                                                                   of a
                                                                                                                                                                   proline-rich
                                                                                                                                                                                                                                                                                                                                                                   296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --- GVHPPAPGVHPPAPGVHPPAPGVHP
                                                               There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             There are no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein;
                                                                                                                                                                                                                                                                                                                                                                   AΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----PQMPP----PAPGVHPP
                                                    Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                       -PG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Repeat.
                                                                                                                                                                   protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                       484
                                                     bу
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              restrictions
                                                        and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        485
                                                                                                                                                                  gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            91;
                                                     for
                                                                                                            collaboration
                                                                                                                                                                   ef.
                                                       n no way
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 no
```

```
RESERVED TO SERVED TO SERV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOFE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-OCT-1996
01-OCT-1996
30-MAY-2000
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                  TISSUE-BRAIN, CEREBELLUM, HIPPOCAMPUS, AND SUBSTANTIA NIGRA;
MEDLINE-96081227; PubMed-8541849;
Schmitt I., Epplen J.T., Riess O.;
Predominant neuronal expression of the gene responsible for
dentatorubral-pallidoluysian atrophy (DRPLA) in rat.";
Hum. Mol. Genet. 4:1619-1624(1995).
-!- TISSUE SPECIFICITY: PREDOMINANT NEURONAL EXPRESSION, ALTHOU
MARKEDLY REDUCED AMOUNTS ARE FOUND IN MOST OTHER TISSUES.
-!- DEVELOPMENTAL STAGE: SIMILAR EXPRESSION AT ALL DEVELOPMENT:
(DAY 14.5 P.C., 17.5 P.C., NEWBORNS AND ADULTS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Repeat; S
NON_TER
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TISSUE=CEREBELLUM, AND STRIATUM; MEDLINE=97317138; PubMed=9173996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rattus norvegicus (Rat).
Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DRPL_RAT P54258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RAT
                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
TISSUE-BRAIN, CEREBELLUM,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Loev S.J., Margolis R.L., Young W.S
Ashworth R.G., Ross C.A.;
"Cloning and expression of the rat
homologue.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neurobiol.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATROPHIN-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DRPLA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 NSMPVPPAPPAPPSPINPPVPPV-----PPLPAAPRTLSPPVPPAPPSPISLAAPPLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        σ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TGPQPRPTQGPHPTGGPQQTPPLAGNPQGPP----PGRPQGP 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAPLP----GPSPPAPP--APPLPNSPAAPPGPPAWPGAPDPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPPPGGPHPRPTQGPPPTGPQPRPTQGPPPTGGPQQRPPPQGPPPPGGPQPRPPQGPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KPGPPAPPMP-----PAPNSPAAPPSPPSPPV--PVFPTPPGPPAPPEPNSSPPAPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPPPAGP----QPRPPQGPPPPAGP-HLRPTQGPPPTGGPQQRYPQSPPPPGGPQPRPPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PAPPAPPLENSPPPPPVPPVPPVPPVPPVPPAPPAANTSNSPLRPPAP-----PAPPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGPQQRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QGPPPP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NQIQIPNQRP-PPSG-SQPRPPVNGSQQGPPPPGGPQPRPPQGPPPPGGP----QPRPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity 36.2
24; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Saliva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6 (Rel. 34, Created)
6 (Rel. 34, Last sequence update)
10 (Rel. 39, Last annotation update)
10 (DENTATORUBRAL-PALLIDOLUYSIAN ATROPHY PROTEIN).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -GGPQPRPPQGPPPPG-----GP--QPRPPQGPPPPGGPQPRP-PQGPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2:129-138(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1
29521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21.1%; 36.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 467; DB 1;
Pred. No. 2.2e-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Craniata; Vertebrata; Euteleostomi; Sciurognathi; Muridae; Murinae; Rat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     7F146824E8AF3269 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PQGPPPPGGPQQRPPQGPPPPGGP-QPRPPQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      s.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       atrophin-I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Li S.-H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (DRPLA disease
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Schilling
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                             ALTHOUGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gene)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rattus
                                                                                                                                                                                         STAGES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   18;
```

Qγ

AASALAYAPAPAVKV

386

뫄

737

ARS----PSPPPKV

ор Оу

AWPGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAA

VGPG-PLPPAGPSSLSSLPPPPPAAPTTGPPLTATQIKQEPAEEY----

ETPESPVPP

371

684

-PP

SPPGPPQYSKRAPSPGSYKTATPPGYKPGSPPSFRTGTPPGYRGTSPPAGPGTFKPGSPT

Q

```
Вþ
                                         д
                                                             ρy
                                                                                                    Qγ
                                                                                                                           Вb
                                                                                                                                              Qy
                                                                                                                                                                                        δÃ
                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                 δõ
                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                밁
                   Qy
                                                                                   밁
                                                                                                                                                                     В
                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                        Best Local Similarity Matches 164; Conserv
                                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; U31777; AAA80337.1; EMBL; X89453; CAA61623.1; INTERPRO; IPR002951; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRINTS;
  565
                                          512
                                                                                    452
                                                                                                                             392
                                                                                                                                                                                         113
                       243
                                                               197
                                                                                                        163
                                                                                                                                                                      332
                                                                                                                                                                                                               274
                                                                                                                                                                                                                                                       214
                                                                                                                                                                                                                                                                                                154
                                                                                                                                                                                                                                   69
                                                                                                                                                                                                                                                                            43
                                                                                                                                                                                                                                                                                                                      7
                                                                                                                                                                                                                                                                                                                                                             Match
                        PNSP--
                                         LESSNSHHAHPYNMSPSLGSLRPYPPGP----AHLPPSHGQVSYSQAGPNGPPVSSS
                                                                                  PNNNTHPGPFPPTGGQSTAHPPAPAHHHHQQQQQPQPQPQPQPQHHHGNSGPPPPGAYPHP
                                                                                                                                                                                                                                                      PPHPQLYPGSAGGGVLSGPPMGPKGGAAASSVGPPSGGKQHPPPTTPIPISSSGASGAPP
                                                                                                                                                                                                                                                                                                                    PAPPAPPSPINPPVPPVP-----PLPAAPRT-----LSPPV-----PPAPP
SNSSGSSSQAAYSCSHPSSSQGPQGASYPFPPVPPITTSSATLSTVIATVASSPAGYKTA
                                                                                                                           AATSQYPASQTLPSYPHSFPPPTSMSVSNQPPKYTQPSLPSQAVWSQGPPPPPPPYGRLL
                                                                                                                                                                     SPHAMGQGMSGLPPGPEKGPTLAPSPHPLPPASSSAPGPPMRYPYSSCSSSSVAASSSSS
                                                                                                                                                                                                              AKPPNTPVGAGNLPSAPP-PATFPHVTPNLPPPPALRPLNNASASPPGMGA-QPIPGHLP
                                                                                                                                                                                                                                ---PNPPV-----PPAPPGPNSAP--APPMPPTPPLPPV-----PPGSGAPRPVPAVPP
                                                                                                                                                                                                                                                                                               PARPYHPPPLFPPSPPPPDSIPRQPESGFEPHPSVPPTGYHAPMEPPTSRLFQGPPPGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PR01222;
                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                       -PFPPAEPE-TPNPPAP----
                                                             -PLTLNP-----PVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPA
                    -----PVFPTPPG----
                                                                                                                                                                                         -MPPAPKRMPALPPAP-PAPPS
                                                                                                                                                                                                                                                                                                                                                                                             Ã,
                                                                                                                                                                                                                                                                            ---LAAPPL---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATROPHIN
                                                                                                                                                                                                                                                                                                                                                                                          965
.; 124778
                                                                                                                                                                                                                                                                                                                                                                                                                 306
383
391
446
480
480
505
572
705
455
705
717
717
                                                                                                                                                                                                                                                                                                                                                 20.3%;
                                                                                                                                                PPTSWLAVPVPPVPPVPPLPVKM----PPSPPVP-----
                                                                                                                                                                                                                                                                                                                                        41;
                                                                                                                                                                                                                                                                                                                                                                                            MISSING
MW; 7FB9
                                                                                                                                                                                                                                                                                                                                                                                                               N -> S (IN I
F -> L (IN I
P -> R (IN I
T -> M (IN I
A -> V (IN I
                                                                                                                                                                                                                                                                                                                                      Score 450.5; DB 1;
Pred. No. 2.4e-12;
1; Mismatches 153;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   POLY-SER.
POLY-PRO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       POLY-SER.
POLY-PRO.
POLY-HIS.
POLY-GLN.
POLY-PRO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POLY-PRO.
POLY-PRO.
POLY-SER.
                                                                                                                                                                                                                                                                                                                                                                                          >> S (IN REF. 2).
> L (IN REF. 2).
>> R (IN REF. 2).
>> M (IN REF. 2).
>> M (IN REF. 2).
SING (IN REF. 2).
7FB9928DCADF9B1F (
                                                                                                       -PAPPLE-----NSPPPPPVPP
                                                                                                                                                                                                                                                                          -PPDPPMPPAIWSALEA--
                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                            CRC64;
                                                                                                                                                                                                                                                                                                                                                             1183;
                                                                                                                                                                                                                                                                                                                                       257;
                                                                                                                                                                                                                                                                                                                                       Gaps
 624
                                                                                                       196
                                                                                                                                                                                                              331
                                                                                                                                                                                                                                   112
                                         564
                                                              242
                                                                                   511
                                                                                                                           451
                                                                                                                                                162
                                                                                                                                                                     391
                                                                                                                                                                                         132
                                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                           89
                                                                                                                                                                                                                                                                                               213
                     265
                                                                                                                                                                                                                                                                                                                                        31;
```

```
RESULT 7
PRF1_LYCES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RR POCCOCO GREET
Ş
                             В
                                                   Qy
                                                                                          В
                                                                                                                  δÃ
                                                                                                                                                  В
                                                                                                                                                                          Qy
                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-CV. VENT CHERRY; TISSUE-FRUIT; MEDILINE-92119262; PubMed-1731999; Salts Y., Wachs R., Kenigsbuch D., Gruissem W., "DNA sequence of the tomato fruit expressed prol TPRP-F1 reveals an intron within the 3 untransle Plant Mol. Biol. 18:407-409(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; X61395; CAA43666.1; -. EMBL; X57076; CAA40361.1; -. HSSP; P24337; 1HXP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                expressed in young tomato fruit."; Plant Mol. Biol. 17:149-150(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Salts Y., Wachs R., Gruissem W., Barg R.;
"Sequence coding for a novel proline-rich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=CV. ARAVA;
MEDLINE=91329722; PubMed=1868217;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM'N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Magnoliophyta; eudicotyledons; Solanales; Solanaceae; Solanum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Eukaryota; Viridiplantae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRF1_LYCES Q00451;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 34-346 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Lycopersicon esculentum (Tomato)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TPRP-F1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-1996 (Rel.
01-OCT-1996 (Rel.
01-OCT-1996 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERPRO; IPR000528; -.
 299
                                185
                                                            246
                                                                                                                       186
                                                                                                                                                                               126
                                                                                                                                                   96
                                                                                                                                                                                                                                          67
                                                                                                                                                                                                              52
                                                                                                                                                                                                                                                                        œ
                                                                                                                                                                                                                                                                                                     7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KDA PROLINE-RICH PROTEIN
   PLPNSPAAPPGPPAWPGAPDPPAPPLPYSSPPAPPACPVPGAPL 342
                                                                                                                                                                   APPAPPSPPTSWLAVPVPPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPPLENS 185
                             -VYPPITPTPPVVSPPIIPTPPIVSPPFVPNPPVVIPPPVVPSPPVV----TPPIVPTP
                                                            PAAPPSPPSPPV---PVFPTPP--GPPAPPEPN--SSPPAPPAPPAAPLPGPSPPAPPAP
                                                                                                                      PPPPPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNS
                                                                                                                                                   SHHGPKPPIVKPPHVPRPPI--VHPPPIVSPPSTPKPPKTP--PETPKPPS-PIPPIVS-
                                                                                                                                                                                                                                          EAPNPPVPPAPPGPNSAPAPPMPPTPPLPP-VPPGSGAPRPVPAVPPMPPAPKRMPALPP 125
                                                                                                                                                                                                                                                                        PYCPYPPS--TPKHPKLPPKVKPPSTQPPHVKP-----PSTPKHPKDPPHV----
                                                                                                                                                                                                                                                                                                     PAPPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSAL
                                                                                                                                                                                                                                                                                                                                                                                                         PF00279; LTP; 1.
NCE 346 AA; 36375 MW;
                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and this statement is not removed. Usage by and for commercial requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                34,
                                                                                                                                                                                                              ----PYVKPPTTPKHPPHVKP-----PSTPKHPKHPPQKPCPPP
                                                                                                                                                                                                                                                                                                                                             20.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Last sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Last annotation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  fruit.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Embryophyta; Tracheophyta; Spermatophyta;
                                                                                                                                                                                                                                                                                                                                   23;
                                                                                                                                                                                                                                                                                                                                Score 445.5; DB
Pred. No. 1.8e-1
23; Mismatches 1
                                                                                                                                                                                                                                                                                                                                                                                                            604E58452FEF16E0 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         core
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         eudicots;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   essed proline-rich untranslated trans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         There are no restrictions ong as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protein
                                                                                                                                                                                                                                                                                                                                                               DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Asteridae; euasterids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Barg
                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                preferentially
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -rich protein
transcript.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ₩.
                                                                                                                                                                                                                                                                                                                                   91;
                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene
                                                                                                                                                                                                              95
                                                                                                                                                                                                                                                                        51
                                                                                                                                                                                                                                                                                                     66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       H;
```

```
Qy
                                                                 Ωy
                                                                                            Вb
                                                                                                                       δÃ
                                                                                                                                                  В
                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                          В
                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EXLP_TOBAC
                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EXLP_TOBAC
Q03211;
Q1-JUN-1994
                                                                                                                                                                                                                                                                          CARBOHYD
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                      SIGNAL
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Plant Cell 4:1041-1051(1992).

-i- TISSUE SPECIFICITY: PISTIL (STIGMA AND STYLE TISSUE).

-i- DEVELOPMENTAL STAGE: EXPRESSION BEGINS IN FLORAL BUDS AFTER

-i- DEVELOPMENTATION AND LEVELS GRADDALLY INCREASE DURING
FLOWER DEVELOPMENT TOWARD ANTHESIS. LEVELS GRADUALLY DECREASE
AFTER POLLINATION AND ARE ABSENT BY THE SIXTH DAY AFTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Goldman M.H., Pezzotti M., Seurinck J., Mariani C.; "Developmental expression of tobacco pistil-specific novel extensin-like proteins.";
                                                                                                                                                                                                                                                                                                    REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                               REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                 Structural protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; Z14019; CAA78397.1; PIR; JQ1696; JQ1696.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entities requires a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=CV. PETITE HAVANA; TISSUE=PISTIL; MEDLINE=93005740; PubMed=1392607;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eukaryota; Viridiplantae; Embryophyta; Tracheophyta; Spen
Magnoliophyta; eudicotyledons; core eudicots; Asteridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-JUN-1994 (Rel. 29, Last sequence update)
15-JUL-1999 (Rel. 38, Last annotation update)
PISTIL-SPECIFIC EXTENSIN-LIKE PROTEIN PRECURSOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-JUN-1994 (Rel.
01-JUN-1994 (Rel.
15-JUL-1999 (Rel.
                                                                                                                                                                                                                                                                                                                                                           DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                PFAM; PF01190; Pollen_
                                                                                                                                                                                                                                                                                                                                                                                                                            INTERPRO;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Solanales; Solanaceae; Nicotiana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Nicotiana tabacum (Common tobacco)
              225
                                         114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             239
                                                                    166
                                                                                                                        111
                                                                                             71
                                                                                                                                                   35
                                                                                                                                                                              51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POLLINATION.
                                                                                                                                                                             PLPPDPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAV 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                         GLLPLIPN--LPDVPPIGGGPP---
                                                                                                                        PPMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPP-----VPPLPVKMPPSPPVPPFP 165
                                                                                                                                                   PLPED-----WPPAEIPLPDI-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -- d.l.d
            PPAPPLKPGPP---
                                                                 PAEPETPNPPAPPAPPLENSPPPPPPPPPPPPPPPLTLNPPVPPAPPAANTSNSPL-RPPA 224
                                                                                                                                                                                                                    Similarity
-
=
=
                                                                                                                                                                                                                                                                                                                                                                                                                           IPR000419; -
                                                                                                                                                                                                                                                                                       1
69
69
76
83
178
                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                          ÀΑ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                               PPPSPSPPPPST----IPLIPPFTGGFLPPL----
                                                                                                                                                                                                                                                                                        23
426
182
73
80
87
182
310
                                                                                                                                                                                                                                                                                                                                                                                              Signal;
              --APPMPPAPNSPAAPPSPPSPPVPVFPTPPGPPAP-PEPNSSPPA
                                                                                                                                                                                                                                                                          44278 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                    19.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -CPPPPPPPAIIPSPPAQPTCPIDALKL
                                                                                                                                                                                                                                                                                                                                                                                                                _Ole_e_I; 1.
=
=
                                                                                                                                                                                                        24;
                                                                                                                                                                                                                                                   4.
N-LINKED (GLCNAC. . .) \\
1; 51A495CC94017812 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                 Repeat; Glycoprotein
                                                                                                                                                                                                        Score 439.5; DB 1
Pred. No. 3.5e-12;
4; Mismatches 85
                                                                                                                                                                                                                                                                                                                                                          PISTIL-SPECIFIC EXTE
4 X 5 AA REPEATS OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
 =
=
=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            426
                                       ----VNQPKPSSP-----SPLVKPPP
                                                                                                                                                    PSPFDGPTFVLPP-----PSPLPSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       There are no restrictions ong as its content is in oved. Usage by and for compressions.
                                                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                         85;
                                                                                                                                                                                                                                                                                                                                                          EXTENSIN-LIKE PROTEIN.
S OF S-P(4).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             268
                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                       (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 genes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Spermatophyta;
                                                                                               -PGSKLPDFA 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                euasterids
                                                                                                                                                                                                         115;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   encoding
                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        o
                                                                                                                                                                                                         25;
```

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뫄
                                                                                                                                                                                               EMBL; X13499; CAA31854.1; -
EMBL; X13506; CAA31860.1; -
EMBL; M36912; AAA33455.1; -
EMBL; M36913; AAA33456.1; -
EMBL; M36914; AAA33457.1; -
                                          REPEAT
REPEAT
REPEAT
                                                                                   REPEAT
REPEAT
                                                                                                    REPEAT
REPEAT
                                                                                                                                                                                        PIR;
 REPEAT
REPEAT
REPEAT
REPEAT
DOMAIN
                                                                                                                              CHAIN
                                                                                                                                                      PRINTS; PR01217; PRepeat; Cell wall;
                                                                                                                                                                                                                                                                                                    This
                                                                                                                                                                                                                                                                                                                            -!- FUNCTION: STRUCTURAL COMPONENT IN PRIMARY CELL WALL.
-!- TISSUE SPECIFICITY: MAINLY IN THE COLEOPTILE NODE AND ROC-!- PTM: EXTENSINS CONTAIN A CHARACTERISTIC REPEAT OF THE PEI SER-PRO(4). THE PROLINE RESIDUE IS HYDROXYLATED AND THEN
                                                                                                                                                                                                                                                                                                                                                             "Molecular cloning of cDNAs encoding a putative cell Zea mays and immunological identification of related Plant Mol. Biol. 11:483-493(1988).
                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=CV. W64A, AND CV. Stiefel V., Perez-Grau L
                                                                                                                                                                                                                                                                                                                                                                                                                                         Zea mays (Maize).
Eukaryota; Viridiplantae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-APR-1990
15-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EXTN_MAIZE P14918;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MAIZE
                                                                   REPEAT
                                                                                                                      DOMAIN
                                                                                                                                        SIGNAL
                                                                                                                                               Hydroxylation.
                                                                                                                                                                                                                                                          entities requires a
                                                                                                                                                                                                                                                                   modified and this statement is not removed.
                                                                                                                                                                                                                                                                                             between
                                                                                                                                                                                                                                                                                                                                                                                        Stiefel V., Perez-Grau L., Albericio F., Ludevid M.D., Puigdomenech P.;
                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             HRGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EXTENSIN PRECURSOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-APR-1990
                                                                            REPEAT
                                                                                                                                                                        INTERPRO; IPR002965; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                Magnoliophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        200
                                                                                                                                                                                                                                                   send
                                                                                                                                                                                                                                                                           by non-profit institutions as long
                                                                                                                                                                                                                                                                                                                      GLYCOSYLATED.
                                                                                                                                                                                        S08314; S08314.
                                                                                                                                                                                                                                                                                           SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FPSPPANPPLIPRRPAPPVVKPLPPLGKPPIVSGLVYCKSCNSY-GVPTLLN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YSSPPA-PPACPVPGAP--LAPLPISGRP-----SNSWVGVFTMLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPAPPAAPLPGPS--PPA---PPAPPLPNSPAAPPGPP-AWP----GAPDPPA-PPL--P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPPSPCKPSPPDQSAKQPPQPP----PAKQPSPPPPPPPPV----KAPSPSPAKQPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPPPVKAPSPSPATQPPTKQPPPPPPRAKKSPLLPPPPPPVAYPPVMTPSPSPAAEPPIIAP
                                                                                                                                                                                                                                                   an
                                                                                                                                                                                17152
                                                                                                                                                                                                                                                  email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (Rel. 14, Created)
(Rel. 14, Last sequence update)
(Rel. 38, Last annotation update)
SCURSOR (PROLINE-RICH GLYCOPROTEIN).
                                                          92
108
129
                                                                                    18
18
34
55
                                                                                                                                                                                                                                                                                                                                                                                                                                  Liliopsida;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                PRICHEXTENSN.
                                                                                                                                                       Glycoprotein;
 267
253
33
54
70
70
1128
1144
1149
1195
2111
2321
2653
                                                                                                                                                                                                                                                          license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                        E41;
                                                                                                                                                                                                  . . . . . .
                                                                                                                                                                                                                                                                                                                                                                                                                                 Embryophyta; Tracheophyta; Spermatophyta;
; Poales; Poaceae; Zea.
 EXTENSIN REPETIVE ELEMENT
                                                                                                                     HIGHLY REPETITIVE ZONE
                                                                                                                             EXTENSIN
                                                                                                                                      POTENTIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                     Signal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             267
                                                                                                                                                                                                                                                                           There are no rest
                                                                                                                                                      Structural protein;
                                                                                                                                                                                                                                                                                                                                                                                                Giralt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AA
                                                                                                                                                                                                                                                                  Usage
                                                                                                                                                                                                                                                                                                                                                                                                Ε.,
                                                                                                                                                                                                                                                                    уd
                                                                                                                                                                                                                                                                                                                                                                                                Ruiz-Avila
                                                                                                                                                                                                                                                                                                                                                                      wall protein polypeptides.
                                                                                                                                                                                                                                                                                   restrictions
                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                     ROOT TIP.
PENTAPEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       310
                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                               from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         199
                                                                                                                                                                                                                                                                            no
                                                                                                                                                                                                                                                                                   on
                                                                                                                                                                                                                                                                                   its
 망
                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SQ
                                                                                                                                                                                                                                                                                                                                                      SLP1_CLOTM
                                                                                                                                                                                                                                                                                                                                                              RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
SIGNAL
CHAIN
DOMAIN
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT
VARIANT
                                 Cell wall;
                                                          INTERPRO;
                                                                                           entities
                                                                                                                                                                                                                                                                                    OLPB
                                                                                                                                                                                                                                                                                             PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                        214
                                                                                                                                                                                                                                                                                                                                                                                                        265
                                                                                                                                                                                                                                                                                                                                                                                                                         168
                                                                                                                                                                                                                                                                                                                                                                                                                                                           112
                                                                                                                                                                                                                                                                                                                                                                                                                                          205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             15
                                                                                   an
```

```
Best Local Similarity
Matches 107; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-JUN-1994 (
01-JUN-1994 (
01-FEB-1996 (
CELL SURFACE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SLP1_CLOTM
Q06852;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN-NCIB 10682;
STRAIN-NCIB 10682;
MEDLINE-93209931; PubMed=8458832;
Fujino T., Beguin P., Aubert J.-P.;
Fujino T., Beguin P., Aubert dium thermocellum gene cluster encorganization of a Clostridium thermocellum gen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cellulosomal scaffolding protein CipA and a protein possibly in attachment of the cellulosome to the cell surface.";
J. Bacteriol. 175:1891-1899(1993).
-i- SUBUNIT: ASSEMBLED INTO MONO-LAYERED CRYSTALLINE ARRAYS.
                                                                                                                                                                                                                                                                                                                                                                              use by non-profit institutions as modified and this statement is not re
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Clostridium thermocel Bacteria; Firmicutes;
                                                                                                                                                                    PROSITE; PS01072;
                                                                                                                                                                                                                                                      EMBL; X67506; CAA47841.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                    between the Swiss Institute of Bioinformatics the European Bioinformatics Institute. There \epsilon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -!- SUBCELLULAR LOCATION: CELL WALL.
-!- SIMILARITY: CONTAINS 4 S-LAYER HOMOLOGY (SLH) DOMAINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           lostridium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         32 TLSPPV-PPAPPSPISLAAPPLPPDPPMPPAIWSALEAPNPPVP-PAPPGPNSAPAPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYTPSPKPPATKPPTPKPTPTYTPTPKPPATKPPTYTPTPPVSHTPSPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            G-PPAPPEPNSSPPAPPAAPPAPPLPGPSPPA-----PPAPPLPNSPAAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVPVFPTPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PPVPPLPVKMPPSPPVPPFPPAEPETPNPPAP-PAPPLENSPPPPPVPPVPPVPPLTLNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KPTPPTYTPSPKPPATKPPTPKPTPPTYTPSPK-----PPTP--KPTPPT-----Y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -PTPPL---PPVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPV 145
                                                                                                                                                                                                PF00395;
                                                                                                                                                                                                                                                                                                            requires a license agreement (See http://www.isb-sib
an email to license@isb-sib.ch).
                                                                                                                                                                                                                          IPR001119;
                                                                                                                                 S-layer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       245
261
267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    thermocellum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel. 29, Last sequence update)
(Rel. 33, Last annotation update)
GLYCOPROTEIN 1 PRECURSOR (OUTER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                  36
36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            z
; Signal; > 28
1664
1664
161
161
                                                                                                                                                                                             SLH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STANDARD;
                                                                                                                                                                 SLH_DOMAIN;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          245
261
28349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bacillus/Clostridium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -PKPTPPTYTPSPKPP--TPKPTPPTYTPS-PKPPTPK-PTPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  15;
            Repeat.
POTENTIAL.
CELU SURFACE GLYCOPROTEIN 1.
4 X 156 AA APPROXIMATE REPER
1.
                                                                                                                                                                                                                                                                                                                                                                                  is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MISSING (IN STRAIN E
S -> C (IN STRAIN E
; A6F406F4645FEECB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 434.5; DB Pred. No. 4.1e-12;
                                                                                                                                                                 N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 114;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1664
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (IN STRAIN E41).
                                                                                                                                                                                                                                                                                                                                                                                                           long
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----ASKPPTPKPTPPTYTPSPKPPTP
                                                                                                                                                                                                                                                                                                                                                                                              ng as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    group;
                                                                                                                                                                                                                                                                                                                                                                        Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LAYER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                       no restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Clostridiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PROTEIN B)
                                                                                                                                                                                                                                                                                                                                                                                  by
                                                                                                                                                                                                                                                                                                                                                                                  and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       encoding the 
ibly involved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 267;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     55;
                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                               .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (S-LAYER
                                                                                                                                                                                                                                                                                                                                                                                  commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         89
                                                                                                                                                                                                                                                                                                                                                                                                                                          on.
                                                                                                                                                                                                                                                                                                                                                                                                              o
                                                                                                                                                                                                                                                                                                                                                                                                           way
                                                                                                                                                                                                                                                                                                                                                                                                                                       its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     17;
```

REPEATS

```
Š
                                                                                                                                                                                                                                                                                                                                                                              멍
                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Sim
Matches 130;
                                                                                                                                                                                    SP62_HUMAN STANDARD;
Q15428;
Q1-NOV-1997 (Rel. 35, Cr
01-NOV-1997 (Rel. 35, La
01-CCT-2000 (Rel. 40, La
SPLICEOSOME ASSOCIATED P
2) (SF3A66).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
DOMAIN
DOMAIN
DOMAIN
SEQUENCE
                              essential yeast splicing
Science 262:105-108(1993)
-I- FUNCTION: SUBUNIT OF
                                                                                                                                           Homo sapiens (Human).
Eukaryota; Metazoa; C
                                                                                                                                                                                                                                                                            HUMAN
                                                                             MEDLINE=94023929; PubMed=8211113; Bennett M., Reed R.;
                                                                                                                     Mammalia;
                                                                                                                                                                                                                                                                                                                               1387
                                                                                                                                                                                                                                                                                                                                                                                                                                  1267
                                                                  "Correspondence between a mammalian
                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                         SF3A2 OR SAP62.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REPEAT
REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REPEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4 PVP---PAPPAPPSPINPPVP---PVPPLPA----APRTLSPPVPPAPPSPISLAAP--
FUNCTION: SUBUNIT OF THE SF3A COMPLEX REQUIRED FOR 'A' COMPL ASSEMBLY FORMED BY THE STABLE BINDING OF U2 SNRNP TO THE BRANCHPOINT SEQUENCE (BPS) IN PRE-MRNA. SEQUENCE INDEPENDENT
                                                                                                                                                                                                                                                                                                                             PTPSTTPTSGSGGSGGS------GGGGGGGGGGTVPTSPTP 1420
                                                                                                                                                                                                                                                                                                                                                     PGAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAASALAYAPAP
                                                                                                                                                                                                                                                                                                                                                                               TDTPSDEPTPSDEPTPSDEPTPSDEPTPSDEPTPSDEPTPSDEPTPSETPEEPTPTTTPT
                                                                                                                                                                                                                                                                                                                                                                                           GPSP---PAPPAPPLPN---SPAAPPGPPAWPGAPDPPAP---PLPYSSP--PAPPACPV
                                                                                                                                                                                                                                                                                                                                                                                                                                 EEPIPTDTPSDEPTPSDEPTPSDEPTPSDEPTPSDEPTPSDEPTPSETPEEPIP
                                                                                                                                                                                                                                                                                                                                                                                                                                              MPPAP-NSPAAPPSPPSPPVPV-FPTPPGPPAP----PEPNSSP-----PAPPAPPAAPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPPPPVPPVPPVPPLTLNPPVP-----PAPPAANTSNSPLRPPAPPAPPLKPGPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SDEPTPSDEPTPSDEPTPSDEPTPSDEPTPSETPEEPIPTDTPSDEPTPSDEPTPSDEPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PTPSETPEEPIPTDTPSDEPTPSDEPTPSDEPTP-SDEPTPSETPEEPIPTDTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PVPAVPPMPPAPKRMPALPPAP-----PAPPSPPTSWLAVPVPPVPPVPPLPVKMP 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EPTPSDEPTPSDEPTPSETPEEPIPTDTPSDEPTPSDEPTPSDEPTP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -PLPPDPPMPPAIWSALEAPNPPVPPAPPG----PNSAPAPPMPPTPPLPPVPPGSGAPR 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PSDEPTPSDEPTPSETPEEPIPTDTPSDEPTPSDEPTPSDEPTPSDEPTPSETP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PTPSDEPTPSDEPTPSDEPTPSETPEEPIPTDTPSDEPTPSDEPTPSDEPTPSDEPTPSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                   Eutheria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1378
1453
1495
1566
1626
1664
                                                                                                                                                                                            (Rel. 35, Created)
(Rel. 35, Last sequence update)
(Rel. 40, Last annotation update)
ASSOCIATED PROTEIN 62 (SAP 62) (SPLICING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 207
409
607
771
                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ΑĄ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1646
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1449
1494
1565
1625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                363
565
763
1377
                                                                                                                                 Chordata;
Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1377 APPROXIMATE TANDEM REPEATS OF T-P-S-D-E-P, 1449 GLY/PRO/SER/THR-RICH. 1494 SLH 1 (INCOMPLETE). 1565 SLH 2. 1565 SLH 3. 1564 SLH 4 (INCOMPLETE). 1584 SLH 4 (INCOMPLETE).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19.5%;
                                                      factor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -PFPPAEP---ETPNPPAP------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 432; DB 1;
Pred. No. 1.6e-11
8; Mismatches 20
                                                                                                                                 Craniata; Vertebrata; Catarrhini; Hominidae;
                                                                                                                                                                                                                                                                PRT;
                                                                  spliceosome
                                                                                                                                                                                                                                                               464
                                                                                                                                                                                                                                                               Å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 1664
                                                                  component
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels 102;
                                                                                                                                                                                                                                                                                                                                                      382
                                                                                                                                             Euteleostomi;
                                                                                                                                                                                                FACTOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ဝှု
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PAPPLENS
                            COMPLEX
                                                                                                                                                                                                3A SUBUNIT
                                                                  an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1031
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1087
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21;
```

```
Вþ
                                                                                                                                                                                                                                                                                                                                                                               Ωy
                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DRPL_HUMAN
                                                                                                                                                                                                                                                              RESULT 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
Matches 119; Conserv
                                                                                                                                                                           DRPL_HUMAN
P54259;
01-OCT-1996
01-OCT-1996
15-JUL-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MRNA processing; mRNA splicing; Nuclear DOMAIN 23 236 POLLY-PRO. DOMAIN 252 256 POLLY-PRO. DOMAIN 458 462 POLLY-PRO. SEQUENCE 464 AA; 49196 MW; 5D4C7B044
                                                  TISSUE=CEREBELLUM, AND BRAIN;
MEDLINE=95144175; PubMed=7842016;
                                                                                                                       Homo sapiens (Human)
Eukaryota; Metazoa; (
                                                                                                                                                   DRPLA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                          Inoue T., Yamada M.
                                       Nagafuchi
                                                                                SEQUENCE FROM N.A.
                                                                                                            Mammalia;
                                                                                                                                                                ATROPHIN-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This
            "Structure and expression of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         between
                                                                                                                                                                                                                                                                                                     461
                                                                                                                                                                                                                                                                                                                                                        410
                                                                                                                                                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                                                                                                                                                            358
                                                                                                                                                                                                                                                                                                                                                                                                                                                               316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         217
                                                                                                                                                                                                                                                                                                                                                                                 239
                                                                                                                                                                                                                                                                                                                                                                                                                                     182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9 PPAPPS-PINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPD----PPMPPAIW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY: TO YEAST PRP11.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BINDING OF SF3A/SF3B COMPLEX UPSTREAM ESSENTIAL, IT MAY ANCHOR U2 SNRNP TO T SUBUNIT: SF3A IS COMPOSED OF SAPS 61,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AND SF3A120 RESPECTIVELY). SUBCELLULAR LOCATION: NUCLEAR (POTENTIAL).
                                                                                                                                                                                                                                                                                                     РP
                                                                                                                                                                                                                                                                                                                              РP
                                                                                                                                                                                                                                                                                                                                                        QPPGVHPSAPGVHPQPPG---
                                                                                                                                                                                                                                                                                                                                                                               MPPA--PNSPAAPPSPPSPPVPVFPTPPG--PPAPPEPNSSPPAPPAAPLPGPSPPA
                                                                                                                                                                                                                                                                                                                                                                                                                            LENSPPPPPVPPVPPVPPLTLNPPVP---PAPPAANTSNSPLRPPAPPAPPLKPGPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                               HPPAPGV--HPPTSGVH---PPAPGVHPPAPGVHPPAPGV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LPPAPPAPPSPPTSWLAVPVPPVPPV-PPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----PTGPAPSGPPGPPQLPPPAPGVHPPAPVVHPPASGVHPPAPGV--HPPAP---GV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPV-PPGSGAPRPVPAVPPMPPAPKRMPA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PPAPPSLPAGPPGVKRPPPP-----LMNGLPPRPPLPESL--PPPPPGGLPLPPMP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            L21990; AAA60301.1;
 disorder,
                                                                                                                                                                                                                                                                                                     462
                                                                                                                                                                                                                                                                                                                             296
                                       S., Yanagisawa H.,
                                                                                                          Eutheria;
                                                                                                                                                             6 (Rel. 34, Created)
5 (Rel. 34, Last sequence update)
9 (Rel. 38, Last annotation update)
(DENTATORUBRAL-PALLIDOLUYSIAN ATROPHY
                                                                                                                                                                                                                                                                                                                                                                                                          HPPAPGVHPPPSAGVHPQAPGVHPAAPAVHPQAPGVHPPAPGMHPQAPG--VHP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                  STANDARD;
dentatorubral and pal
                                                                                                          Primates;
                                                                                                                       Chordata;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19.0%;
39.4%;
                                                                                                                                                                                                                                                                                                                                                        -VHPSNPGVHPPTPMPPMLRPPLP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12;
                                        Ohsaki
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 421; DD -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             POLY-PRO.
5D4C7B044AE81C71
                                                                                                         Craniata; Vertebrata; Euteleostomi; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
pallidoluysian
                                       Œ,
                                                                                                                                                                                                                                1185
           responsible
                                       Shirayama
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     THE
                                                                                                                                                                                                                                  A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRE-MRNA.
AND 114 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CRC64;
                                                                                                                                                                PROTEIN)
                                       Ŧ.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               BRANCH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Repeat
atrophy
              for the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (SF3A60,
                                        Tadokoro
                                                                                                                                                                                                                                                                                                                                                        -SEGPGNIPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         is
for
(DRPLA).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                        ~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SF3A66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                        460
                                                                                                                                                                                                                                                                                                                                                                               294
                                                                                                                                                                                                                                                                                                                                                                                                                                   238
                                                                                                                                                                                                                                                                                                                                                                                                                                                               357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             19;
```

```
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                          DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                         EMBL;
                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entrepean Bioinformatics Institute. There are no restructed by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Li S.-H., McInnis M.G., Margolis R.L., "Novel triplet repeat containing genes expression, and length polymorphisms."; Genomics 16:572-579(1993).

-i- TISSUE SPECIFICITY: THE LEVELS ARE
                                                                                                                                                                      DOMAIN
                                                                                                                                                                                                                                                                                                                                           entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=96262314; PubMed=8965642; Margolis R.L., Li S.-H., Young W.S., W Kidwai A.S., Ashworth R.G., Ross C.A.;
                                                                                     DOMAIN
                                                                                                                                    DOMAIN
                                                                                                                                               DOMAIN
                                                                                                                                                          DOMAIN
                                                                                                                                                                                   DOMAIN
                                                                                                                                                                                              DOMAIN
                                                                                                                                                                                                         DOMAIN
                                                                                                                                                                                                                       DOMAIN
                                                                                                                                                                                                                                              PRINTS;
                                                                                                                                                                                                                                                        INTERPRO;
                                                                                                                                                                                                                                                                                  HSSP;
                                                                                                                                                                                                                                                                                             EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    · 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=93315145; PubMed=8325628;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TISSUE-BRAIN CORTEX;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 470-725
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            brain
                                                                         DOMAIN
                                                                                                 DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "DRPLA gene (atrophin-1) sequence and mRNA expression brain.":
                                                                                                                                                                                                                                                                                                                                                                                                                                                      DISEASE. DEFECTS IN DRPLA ARE THE CAUSE OF DENTATORUBRAL-
PALLIDOLUYSIAN ATROPHY, AN AUTOSOMAL DOMINANT NEURODEGENERATIVE
PALLIDOLUYSIAN ATROPHY, AN AUTOSOMAL DOMINANT NEURODEGENERATIVE
PALLIDOLUYSIAN ATROPHY, ALOSS OF NEURONS IN THE DENTATE
NUCLEUS, RUBRUM, GLOGUS PALLIDUS AND LUYS'SODY. CLINICAL FEATURE
ARE MYOCLOUS EPILEPSY, DEMENTIA, AND CEREBELLAR ATAXIA. ONSET C
THE DISEASE OCCURS USUALLY IN THE SECOND DECADE OF LIFE AND DEAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        OVARY, TESTIS AND PROSTATE. LOWER LEVELS ARE DETECTED IN THE LIVER, THYMUS AND LEUKOCYTES.
POLYMORPHISM: THE POLY-GLIN REGION OF DRPLA IS HIGHLY POLYMORPHIC (7 TO 23 FIRST) IN THE NORMAL POPULATION AND IS EXPANDED TO ABOUT 49-75 REPEATS IN DRPLA PATIENTS. LONGER EXPANSIONS RESULT EARLIER ONSET AND MORE SEVERE CLINICAL MANIFESTATIONS OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                             IN THE FOURTH.
                                                                                                                                                                                                                                                                      125370;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Genet.
                                                                                                                                                                                                                                                                                L10377; -; NO P00651; 1LRA.
                                                                                                                                                                                                                                                                                                         D31840; BAA06626.1; U23851; AAB50276.1;
                                                                                                                                                                                                                      repeat (
                                                                                                                                                                                                                                             PR01222;
                                                                                                                                                                                                                                                          IPR002951;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mol.
                                                                                                                                                                      302
376
386
442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8:177-182(1994)
                                                                                                                                                                                                                    t expansion;
73 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Brain Res. 36:219-226(1996)
  A
                                                                                                                                                                                                                                                                                            NOT_ANNOTATED_CDS
                                                                                                                                                                                                                                             ATROPHIN
                           305
382
397
447
497
574
707
707
815
827
934
933
333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FROM N.A
  124785
                                                                                                                                                                                                                                 Polymorphism
                      POLY-PRO.

ARG/ALIA-RICH (MIX
ARG/GLU-RICH (MIX
ARG/GLU-RICH (MIX
ARG/GLU-RICH (MIX
ARG/GLU-RICH (MIX
ARG/GLU-RICH (IN REF. 2
M -> I (IN REF. 2
M -> I (IN REF. 3
 X G O X
                                                                                                                    POLY-HIS.
POLY-GLN.
POLY-PRO.
POLY-SER.
                                                                                                                                                                     POLY-SER.
POLY-PRO.
                                                                                                                                                                                              POLY-SER.
                                                                                                                                                                                                        POLY-PRO.
                                                                                                                                                                                                                      SER/GLU-RICH (MIXED CHARGE).
> H (IN REF. 2).

I (IN REF. 2).

T (IN REF. 3).

A (IN REF. 2).

56C306267331C005
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wagster M.V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E RELATIVELY HIGH IN LEVELS ARE DETECTED
                                                                                                                                                                                                                                                                                                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Antonarakis S.E in human brain:
                                                                    H (MIXED CHARGE).
H (MIXED CHARGE).
H (MIXED CHARGE).
                                                           2).
  CRC64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S.E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Stine
                                                                                                                                                                                                                                                                                                                                                                                           restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      cloning,
                                                                                                                                                                                                                                                                                                                                                                    and
                                                                                                                                                                                                                                                                                                                                                                                                       EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ross
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0.0.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        THE
                                                                                                                                                                                                                                                                                                                                                                                                                   ۵
                                                                                                                                                                                                                                                                                                                                                                                                                                                      ONSET OF AND DEATH
                                                                                                                                                                                                                                                                                                                                                                                                         collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  BRAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C.A.;
                                                                                                                                                                                                                                                                                                                                                                                                        outstation
                                                                                                                                                                                                                                                                                                                                                                              n
                                                                                                                                                                                                                                                                                                                                                                                no
                                                                                                                                                                                                                                                                                                                                                                                            on
```

Query Match
Best Local Similarity
Matches 161; Conserv

Conservative

37;

Score 419; DB 1; Pred. No. 4.4e-11; 7; Mismatches 164

164;

Gaps

30;

Length 1185; Indels 250;

18.9%; 26.3%;

```
20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-OCT-1996
01-OCT-1996
01-NOV-1997
                                                                                                                                                         TISSUE-BOOT NODULES;

TISSUE-BOOT NODULES;

REDLING-9135883; PubMed-2103455;

Szczyglowski K., Legocki A.B.;

*Isolation and nucleotide sequence of cDNA clone encoding

*Isolation and nucleotide sequence of cDNA clone with the code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encoding and code of cDNA clone encode of cDNA clone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 _LUPLU
NO75_I
                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-1996 (Rel. 34, Created)
01-OCT-1996 (Rel. 34, Last sequence up
01-NOV-1997 (Rel. 35, Last annotation
EARLY NODULIN 75 PROTEIN (N-75) (NGM-7
                      This SWISS-PROT entry is copyright. It is produbetween the Swiss Institute of Bioinformatics
                                                                                          specific (hydroxy)proline-rich protein Plant Mol. Biol. 15:361-363(1990).
-i- FUNCTION: INVOLVED IN EARLY STAGES
-i- SIMILARITY: TO OTHER PLANTS N-75.
                                                                                                                                                                                                                                                                                         SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                    Fabales;
                                                                                                                                                                                                                                                                                                                                                             Magnoliophyta;
                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Viridiplantae; Embr
                                                                                                                                                                                                                                                                                                                                                                                                                                    ENOD2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q06841;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPPPYGKRAPSPGAYKTATPPGYKPGSPPSFRTGTPPGYRGTSPPAGPGTFKPGSPTVGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PARPYHPPPLFPPSPQPPDSTPRQPEASFEPHPSVTPTGYHAPMEPPTSRMFQAPPGAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ALAYAPAPAVKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPEPNSSPPAPPAAPLPGPSPPAPPA-----PP--LPNSPAAPPG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SSSASPFPASQALPSYPHSFP--PPTSLSVSNQPPKYTQPSLPSQAVWSQGPPPPPPPYGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KPPTTPVGGGNLPSAPPPANFPHVTPNLPPPPALRPLNNASASPPGLGA-QPLPGHLPSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VPPAPP--GPNSAPAPP------MPPTPPLPPV-----PPGSGAPRPVPAVPP-- 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PAPPAPPSPINPPVPPVP------PLPAAPRT-----LSPP-----VPPAPPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----PSPPPKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       G-PLPPAGPSGLPSLPPPPPAAPASGPPLSATQIKQEPAEEY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PHPLEGGSSHHAHPYAMSPSLGSLR-PYPPGPAHLPPPHSQVSYSQAGPNGPPVSSSSNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \verb|LLANSNAHPGPFPPSTGAQSTAHPPVSTHHHHHQQQQQQQQQQQQQQQQQHGNSGPPPPGAF|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPPLENSPPPPPVP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YAMGQGMGGLPPGPEKGPTLAPSPHSLPPASSSAPAPPMRFPYSSSSSSAAASSSSSS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PHPQLYPGGTGGVLSGPPMGPKGGGAASSVGGPNGGKQHPPPTTPISVSSSGASGAP-PT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DIADT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SSSTSQGSYPCSHPSPSQGPQGAPYPFPPVPTVTTSSATLSTVIATVASSPAGYKTASPP
                    the
                                                                                                                                                                                                                                                                                                                                    Fabaceae;
Swiss Institute
Bioinformatics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -MPPAPKRMPALPPAP-----PAPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAAPPSP------PSPPVPVFPT---
                                                                                                                                                                                                                                                                                                                                                           idiplantae; Embryophyta; Tracheophyta; Spermatophyta;
eudicotyledons; core eudicots; Rosidae; eurosids I;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --LAAPPL-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -PPAANTSNSPLRPPAPPAPPLKP-----
                                                                                                                                                                                                                                                                                                                                    Papilionoideae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        (NGM-75) (FRAGMENT)
                                                                                                                                                                                                                                                                                                                                    Lupinus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 434
                                                                                                                      얁
There are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA
                                        produced through
                                                                                                                      ROOT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPDPPMPPAIWSALEAPNPP
                                                                                                                      NODULE
                      and
no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----ppG-----pp
                      the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPPAPPMPPAPNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -ETPESPVPPARS
                                                                                                                      DEVELOPMENT
restrictions
                      EMBL
                                                                                                                                                                 nchle-
lupin.";
                                          a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPAWP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SPPT: 135
                      outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 589
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   629
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               392
```

VII.

maps

Þ

```
STATES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Ma
Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                               K2_HUMAN
             Bruce R., Quan Carrano A.V.;
                                                                                                                                                                                                                                                                           Q9UMN6; Q9UK25; O95836; Q9Y669; Q9Y668; O15
01-OCT-2000 (Rel. 40, Created)
01-OCT-2000 (Rel. 40, Last sequence update)
01-OCT-2000 (Rel. 40, Last annotation updatation)
                                       Lamerdin J
Garcia E.,
                                                                                            "Mammalian trithorax- and ASH1-like proteins: putative regulators which contain PHD fingers and SET domains."; Submitted (JUN-1998) to the EMBL/GenBank/DDBJ databases
                                                                                                                                    Angrand P.O., Valvatne H., Jeanmougin F., Adamson A., van der Hoeven F., Olsen L., Tekotte H., Huang N., Poch Lamerdin J., Chambon P., Losson R., Stewart A., Aasland
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 entities
or send a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            modified
                                                                   SEQUENCE
                                                                                                                                                                SEQUENCE FROM N.A. (LONG ISOFORM).
Angrand P.O., Valvatne H., Jeanmou
                                                                                                                                                                                                             Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; X55371; CAA39050.1; Nodulation; Repeat.
                                                                                                                                                                                                                                     Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                   TRX2_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                  (KIAA0340)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NON_TER
                                                                                                                                                                                                                                                                                                                                                                                                                       346
                                                                                                                                                                                                                                                                                                                                                                                                                                                   322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Match
                                                                                                                                                                                                                                                     OR HRX2 OR MLL2.
                                                                                                                                                                                                                                                                                                                                                                                                                       PPIEFPPHEKPPVYEPPYEKPPSVCPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPL---PYSSPPA-----PPACPVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IEYPPPHEKPPIEYPPHEKPPVYEPPYEKPPPVHPPPDEKPPIEYPPLEKPPVHEPPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SPMHEPPYEKAPPVHLPPHEKPPIEYAPPHEKPPVEYPPPHVKPPVEYPSPAEKPPTHEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EPNSSPPAPPAPPAAPLPGPSPPAPPAPPLPNSPAAPPGPPAWP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TSNSPLRPPAPPAPPLKPGPP--APPM--PPAPNSPAAPPSPPSPPVPVFPTPPGPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VPPFPPAE-PETPNPPAPPAPPLENSP---PPPPPVPPVPPVLTLNPPV--PPAPPAAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PHEKPPIEYSPPHEKPPVHEPPYEKPPLVHPPPHDKPPIEYHPPHEKPPIEYPPPHEKPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PKRMPALPPAPP--APP--SPPTSWLAVPVPPVPPVPPL------PVKMPP---SPP 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PAIWSALEAPNPPVPPA---PPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPA 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SPPVHPPPHEKPPIVHPPPHEKPPLFEPPFEKPPPAHPPPVHPPPHEKPPIEYPPPHTKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SMPVPPAPPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPL--PPDPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EKPPPAQPPPHDKPPIEYPPPHEKPPVYEPPYERSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                        J.E., McCready P.M., Adamson A.W.,
., Kyle A., Ramirez M., Stilwagen S
., Quan G., Montgomery M., Ow D., Kol
                                                               FROM N.A. (LONG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               non-profit institutions as lon
and this statement is not remov
requires a license agreement (S
an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ·IEYPPPHVKPPIQYPP-PHEKP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    434 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                σ
                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1
407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      49827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         institutions as long
                                                                   ISOFORM).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      X
V
                                                                                                                                                                                                                                                                               LINEAGE LEUKEMIA GENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           is not removed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 415; DB 1;
Pred. No. 3.4e-11
2; Mismatches 17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 36 X 8 AA APPROXIMATE REF
P-P-P-H-E-K-P-P.
8CE8E140C21B6664 CRC64;
                                                                                                                                                                                                          Craniata; V
Catarrhini;
                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                       373
                                                                                                                                                                                                                                                                                                                                                                                                                                                   338
                                                                                                                                                                                                                                                                                                                                                   2715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -PIEYPLPHEKPPVYEP-PYEKPPPVHPP 109
                                                                                                                                                              F.,
                                                                                                                                                                                                                                                                                            update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                          Vertebrata;
                                                                                                                                                                                                                                                                                                                                      015022;
                        W., Burkhart-Schultz
n S., Garnes J., Dang
Kobayashi A., Olsen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 1;
                                                                                                                                                                                                          Hominidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -PVHPPSHEKPPFVYP--PPHEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Usage
                                                                                               databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                               HOMOLOG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REPEATS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            уd
                                                                                                                                                                                                                          Euteleostomi;
                                                                                                                                                                                                             Homo
                                                                                                                         chromatin
                                                                                                                                      R ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                     Danganan L.,
                                                                                                                                                                                                                                                                                 N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           is
                                                                                                                                                                                                                                                                               PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                           A.O.,
                                                    ~
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           no
              DNA_BIND
DOMAIN
DOMAIN
DOMAIN
                                                                               DNA_BIND
                                                                                                                                                                                                                                                                                           EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Sequence
Submitted
                                                                                                                                      PFAM;
PFAM;
                                                                                                                                                                                                                                    EMBL;
                                                                                                                                                                                                                                                  EMBL;
EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                  use by non-profit institutions as lon-
modified and this statement is not remov-
entitles requires a license agreement (s)
or send an email to license@isb-sib.ch).
                                                                                                                      DNA-binding; Bromodomain;
                                                                                                                                                                                                                                                                                                                                                                                          the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "MLL2: A new mammalian member of the trx/MLL Genomics 59:187-192(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TISSUE-PLACENTA, AND BONE MEDLINE-99339983; PubMed-10 FitzGerald K.T., Diaz M.O.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "MLL2, the second human homolog of the to 19q13.1 and is amplified in solid oncogene 18:7975-7984(1999).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TISSUE=TESTIS, AND LEUKOCYTE; MEDLINE=20105772; PubMed=10637508;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 111-2715 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   code
                                                                                                                                                                 PFAM; PF00628; PHD; 3.
                                                                                                                                                                                 INTERPRO;
                                                                                                                                                                                                          INTERPRO;
                                                                                                                                                                                                                          EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                          between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PARTIAL SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Huntsman D.G., Chin S.-F., Muleris M., Wiedemann L.M., Aparicio S., Caldas C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Prediction of the coding sequences of The complete sequences of 100 new cDNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Miyajima
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=97349984;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nagase T., Ishikawa
                                                                                                                                                                                                                       L; AJ007041; CAB45385.1; -.
L; AD003671; -; NOT_ANNOTATED_CDS.
L; AB00202; BAA20763 2; -.
L; AF186605; AAD56420.1; -.
L; AF104918; AAD17932.1; -.
L; AF105280; AAD26113.1; -.
L; AF105280; AAD26112.1; -.
zf-CA..
Bromodomain,
on regulation; A.
37 44
110 117
357 365
4 1203 1257
1N 1253 137
"N 1337 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FUNCTION: DOSIBLY ACTS AS A TRANSCRIPTIONAL REGULATORY FACTOR.
SUBCELLULAR LOCATION: NUCLEAR (BY SIMILARITY).
ALTERNATIVE PRODUCTS: 2 ISOFORMS; A LONG FORM (SHOWN HERE) AND
TRUNCATED FORM; ARE PRODUCED BY ALTERNATIVE SPLICING.
TISSUE SPECIFICITY: WIDELY EXPRESSED. HIGHEST LEVELS IN TESTIS.
ALSO FOUND IN BRAIN, BONE MARROW, HEART, MUSCLE, KIDNEY, PANCRE
SPLEEN, THYMUS, PROSTATE, OWARY, INTESTINE, COLON, PERIPHERAL
                                                                                                                                                                                                                                                                                                                                                          s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way ified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                              SIMILARITY: CONTAINS 1 BROMODOMAIN.
SIMILARITY: CONTAINS 1 'SET' DOMAIN.
SIMILARITY: CONTAINS 3 PHD-FINGER DOMAINS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BLOOD LYMPHOCYTES, ADISEASE: OFTEN AMPLISEMILARITY: BELONGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Res.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FACTORS
                                                                                                                                      PF00856; SET; 1.
PF02008; zf-CXXC; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4:141-150(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OF 816-2715
                                                                                                                                                                                                        IPR001214; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 large
                                                                                                                                                                             IPR001965; -. IPR002857; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LYMPHOCYTES, AND PLACENTA.
SE: OFTEN AMPLIFIED IN PANCREATIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           analysis of a 1 Mb region in human 19q13.1."; (NOV-1996) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tanaka A., Kotani H., Nomura N., Ohara O.; of the coding sequences of unidentified human sequences of 100 new cDNA clones from brain ye proteins in vitro.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AND BONE MARROW;
PubMed=10409430;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PubMed=9205841;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        o
                          ; Alternative
A.T HOOK
A.T HOOK
A.T HOOK
A.T HOOK
PHD 1.
PHD 2.
PHD 3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N.A.
                                                                                                                       Nuclear protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        THE TRITHORAX
                        A.T
A.T
A.T
PHD
PHD
PHD
             BROMODOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (LONG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (LONG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the Drosophila trithorax id tumor cell lines.";
                                                               splicing.
k (BY SIMIL
k (BY SIMIL
k (BY SIMIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TRUNCATED ISOFORMS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ISOFORM)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISOFORM)
                                                                                                                                                                                                                                                                                                                                                  (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Batley
             (DIVERGENT)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FAMILY OF TRA
                                                                 SIMILARITY).
SIMILARITY).
                                                                                                                       2inc-finger;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          family of genes.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S.J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Seki N.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TRANSCRIPTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              O.;
human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Collins
                                                                                                                         Metal-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                which can
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              genes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PANCREAS,
```

B δÃ 밁 δÃ 밁 Q В ρ 밁 Qy 밁

δÃ

```
Ş
                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ДЪ
                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 141
                                                                    20-MAR-1987 (Rel. 04, 0
13-AUG-1987 (Rel. 05, 1
15-DEC-1998 (Rel. 37, 1
SALIVARY PROLINE-RICH I
CONTAINS: BASIC PEPTII
                                                                                                                                         _HUMAN
PRP1_HUMAN
P04280;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARSPLIC
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DOMAIN
DOMAIN
DOMAIN
DOMAIN
DOMAIN
DOMAIN
DOMAIN
DOMAIN
DOMAIN
VARSPLIC
                           Homo sapiens (Human)
Eukaryota; Metazoa; (
                 Mammalia;
                                                                                                                                                                                                                                                                                                                                     677
                                                                                                                                                                                                                                                                                                                                                                                             625
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      402
                                                                                                                                                                                                                            791
                                                                                                                                                                                                                                                    353
                                                                                                                                                                                                                                                                                736
                                                                                                                                                                                                                                                                                                           295
                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                        192
                                                                                                                                                                                                                                                                                                                                                                                                                                                    568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12
                                                                                                                                                                                                                            K----MFSLLKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---TTSPPVPQEPAPVPSPPRAPTPPSTPVPLPEKRRSILREPTFRWTSLTRELPPPPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPVPPA-----PP-----GPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPP
                                                                                                                                                                                                                                                   NSWVGVFTMLSR
                                                                                                                                                                                                                                                                              QLLQPLQALQTQLLPQALP--PPQPQLQPPPSPQQMPPLEKA---RIAGVGSLPLSGVEE
                                                                                                                                                                                                                                                                                                                                                                PAPNSPAAPPSPPSP-PVPVFPT----PPGPPAPPEPNSSPPAPPAPPAAPLPGPSPPA
                                                                                                                                                                                                                                                                                                                                                                                                                     PPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPP------LKPGPPAPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VKMPPSPPVPPFP---PAEPETPNPPAPPAPPLENS-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KSTTFLKNIRQFIMPVVSARSSRVIKTPRRFMDEDPPKPP----KVEVSPVLRPPI----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPVVPATCSRKRGRPPLTPSQRAEREAARAGPEGTSPPTP--TPSTATGGPPEDSPTVAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    --PPSTSPPPPLTP--PPSTSPPPPLCPPPPPPVSPPPL-PSPPPPPAQEEQEESP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PPSPINPPVP-PVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSALEAPN
                                                                                                                                                                                                                                                                                                         PPAPPLP--NSPAAPPGPPAWPGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPISGRPS
                                                                                                                                                                                                                                                                                                                                    PEPEPPPADDSPAEPEPRAVGRTNHLSLPRFAPVVTTPVKAEVSPHGAPALS-NGPQTQA
                                                                                                                                                                                                                                                                                                                                                                                             PPPPPAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         141;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                 Eutheria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2586
262
248
362
402
808
1963
2251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              583
834
941
1317
1362
1438
2622
2715
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                             -SP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ΑA;
                                                                                                                                                                                                                            798
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2715
834
941
1317
1362
1438
2622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MPPAPKRMPALPPAP-----PAPPSPPTSWLAVPVPPV--PPVPPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2715
37
255
398
398
771
812
1970
2259
582
                 Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18.6%;
                            Chordata;
                                                                                                                                                                                                                                                                                                                                                                                           PPAP--ATSSRRPLLLRAPQFTPSEAHLKIYESVLTPPPLGAPEA
                                                                    Last sequence update)
Last annotation update)
[ PROTEIN PRECURSOR (CLONES)
IDE IB-6; PEPTIDE P-H].
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              293511
                                                                                                                           Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MISSING (IN K -> E (IN F E -> Q (IN I D -> N (IN D -> N (IN I N D 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 413; DB
Pred. No. 1.3e
20; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRO-RICH.
POLY-GLN.
POLY-PRO.
POLY-PRO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VSARSSRVIKTPRRFMDEDPPKPPKVEVSPVLRPPTTTSPP
VPQEPAPVPS -> PLSQSLLLPMTLQLSLSLGQWAAPTTS
ACLDSPLWSPLLLRPRCPLTGLQL (IN ISOFORM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TRUNCATED)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      POLY-PRO.
ASP/GLU-RICH
               Craniata; Vertebrata;
Catarrhini; Hominidae
                                                                                                                                                        PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              C0615B981BBEB7BF
                                                                                                                                                        331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (IN ISOFORM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REF.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1; I
1.3e-10;
hes 157;
                                                                                                                                                        A
               Hominidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          555555
                                                                                  CP3,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 2715;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TRUNCATED).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 114;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRC64;
                            Euteleostomi;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----PPPPPV
                                                                                     CP4
                                                                                    AND
                                                                                  CP5)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                    735
                                                                                                                                                                                                                                                                                                                                                                294
                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                    624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25;
Š
                          DЬ
                                                    Q
                                                                                 В
                                                                                                      δÃ
                                                                                                                                        В
                                                                                                                                                                δõ
                                                                                                                                                                                             Дb
                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                   Дb
                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Repeat;
SIGNAL
CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           peptide P-H.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT
  330
                            243
                                                       290
                                                                                                              237
                                                                                                                                         134
                                                                                                                                                                   183
                                                                                                                                                                                                                       123
                                                                                  190
                                                                                                                                                                                             89
                                                                                                                                                                                                                                                    30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Biochem.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     168730;
                                                                                                                                                                                                                                                                                                         111;
```

```
This SWISS-PROT entry is copyright. It is produced through a c between the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and fo entities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-86243355; PubMed=3521730; Kauffman D., Hofmann T., Bennick A., Kel. "Basic proline-rich proteins from human growalent structures of proteins IB-1 and Biochemistry 25:2387-2392(1986).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=85289325; PubMed=2993301; Maeda N., Kim H.-S., Azen E.A., Smithies O.; Maeda N., Kim H.-S., Azen E.A., Smithies O.; "Differential RNA splicing and post-translational human salivary proline-rich protein gene system."; J., Biol. Chem. 260:11123-11130(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=84161824; PubMed=6671974;
Saitoh E., Isemura S., Sanada K.;
"Further fractionation of basic p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   parotid saliva and complete amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 276-331.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 214-331.
                                                                                                                                                                                                                                                                                                                                                                                          65 ALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPR--PVPAVPPMPPAPKRMPA 122
PAPPACPVPGAPLAP--LPISGRPS
                                                                                                                                                                                                                                                                                                            LPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPPL 182
                                                                                                                                                                                                                                                                                                                                                     SLIAGNPQ-GPSPQGGNKPQGPPPPGKPQGPPPQGGNKPQGPPPPGKPQGPPPQGDKSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C25372; C25372.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A03291; PIHUB6
                                    PPPQGGNKPQGPPPGKPQGPPAQGGSKSQSARAPPGKPQGPPQQEGNNPQGPPPPAGGN
                                                                                                                                                       PPMPPAPNSPAAPP-----SPPSPPVPVFPTPPGPPAPPEPNSSPPAPPAAPLPG
                                                                                                                                                                                                                                   ENSPPPPPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPALKP-GPP----A
                                                                                                                                                                                                                                                                          SPRSPPGKPQGP
                                                                         PSPPA---PPAPPLPNSPAAPP-----
                                                                                                                PQGPPPPGKPQGPPPQGDKSRSPQSPP---
                                                                                                                                                                                            --- PPGKPQGP-PPQGDKSQSPRSPPGKPQGPPPQGGNQPQGPRPPPGKPQGPPQQGGNR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         K03205; AAA60186.1;
K03206; AAA60187.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                K03204; AAA60185.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Parotid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 276
331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            94:1991-1997(1983).
                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gland;
16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 276
32596
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 331
331
238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          258
                                                                                                                                                                                                                                                                                                                                                                                                                                                 18.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Multigene family;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MW.
                                                                                                                                                                                                                                                                                                                                                                                                                                 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PEPTIDE 1B-6.
PEPTIDE P-H.
PEPTIDE P-H.
MISSING (IN CLONE CI
/FTId=VAR_005561.
MISSING (IN CLONE CI
/FTId=VAR_005562.
A -> S (IN REF. 2 A)
W; 3F481FF8EBA39751 (W)
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 412;
Pred. No. 3
                                                                                                                                                                                                                                                                          PPQGGNQPQGPPPPGKPQGPPPQGGNKPQGPP-
                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   proline-rich
no acid sequer
                                                                                                                -GKPQGP--PPQGGNQPQGPPPPPGKP-QG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Keller P.;
man parotid
and IB-6.";
                                                                           -GPPAWPGAP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 erich peptides from sequence of basic pa
                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 1;
.8e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Saliva;
                                                                                                                                                                                                                                                                                                                                                                                                                                 140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2 AND 3).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CP-5).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CP-4)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              saliva:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cleavages
                                                                         -DPPAPPLPYSSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   proline-rich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       human
                                                                                                                                                                                                                                                                                                                                                                                                                                 64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the
                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         in no way
                                      302
                                                                                                                                                                                                                                                                                                                                                     88
                                                                                                                242
                                                                                                                                                       289
                                                                                                                                                                                              189
                                                                                                                                                                                                                                   236
                                                                         329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9
                                                                                                                                                                                                                                                                                                                                                                                                                                 15;
```

₽

Search completed: January 5, 2001, 14:31:28 Job time: 359 sec

١,

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             lotal number of hits satisfying chosen parameters:
       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
     Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            seq length: 0 seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PIR_66:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query
Match
     BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-461-774-10
2216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  195891 seqs, 67900655 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 5, 2001, 14:28:42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 NSMPVPPAPPAPPSPINPPV......NGAAAAASALAYAPAPAVKV 386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pir1:*
pir2:*
pir3:*
pir4:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length DB
     1188
489
1580
1580
1580
1580
388
439
1786
280
280
280
280
280
376
817
3020
31611
3020
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
31611
3161
                                                                                                                                                                                                                                                                                                                                                                                              T06291
S49915
T11622
S06733
T31611
T04859
                                                                                                                                                                                                                                                                                                                                              T10863
S25298
T06782
                       $20500
T47617
$22697
T47618
$22456
T29299
T14195
$25299
PIHUB6
F75518
                                                                                                                                                                                        T01456
JU0465
T11671
S71558
S51342
S51342
T38236
A43932
T07598
T05717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Search time 67.42 Seconds (without alignments) 388.752 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   195891
                                                                                                                                                                                                                                                                                                                                                                                            extensin homolog T
extensin-like prot
extensin class 1 p
hydroxyproline-ric
hypothetical prote
extensin homolog F
proline-rich prote
probable extensin
hydroxyproline-ric
extensin-like prot
extensin - volvox
extensin like prot
extensin like prot
hydroxyproline-ric
hypothetical prote
extensin homolog T
extensin procursor
salivary proline-r
hypothetical prote
hydroxyproline-ric
                                                                                                                                                                                                                    extensin precursor
extensin (clone To
extensin - soybean
extensin homolog F
extensin precursor
extensin rike prot
probable cell wall
verprolin - yeast
hypothetical prote
mucin 2 precursor,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT
T06291
```

ŏ

45	44	43	42	41	40	39	38	37	36	ω 5	34	<u>ω</u>	32	31	30
439.5	440	441	443	445	445	445.5	446	452	452.5	452.5	453	456.5	462.5	463	464.5
19.8	19.9	19.9	20.0	20.1	20.1	20.1	20.1	20.4	20.4	20.4	20.4	20.6	20.9	20.9	21.0
426	731	393	429	5262	381	346	461	574	3534	378	574	699	368	317	513
Ν	N	Ν	N	N	2	N	ν	N	N	2	N	2	2	2	Ν
JQ1696	T04455	PQ0479	T06296	T03454	S52985	S19129	T10741	T38819	T42567	S14959	T43556	T05225	C29356	A28996	T14194
pistil extensin-li	hypothetical prote	pistil extensin-li	extensin-like prot	ALR protein - huma	cell wall protein	proline-rich prote	extensin-like prot	wiskott-aldrich sy	tegument protein 2	proline-rich prote	Wiskott-Aldrich sy	extensin homolog F	hydroxyproline-ric	proline-rich prote	extensin homolog T

ALIGNMENTS

Sch

Db	Qy	Дb	Qy	ф	Qy	Db	Qy	Db	Оy	рь	Оy	Db	Qy	Qu Be Ma	A; Map A; Not	C;Ge	A; Cr	A; Mo	A; Re	R;Be subm	C;Sp C;Da	exte
729 HQSPPPPSPEYEGPLPPVIGVSYASPPPPP 758	314 PGAPDPPAPPLPYSSPPAPP 333	SSPPPEVHYHSPPSPVHYSSPPPPPSAPCEESPPPAPVVHHSPPPPMVHHSPP-PPVI	268 -APPEPNSSPPAPPAPPAAPLPGPSPPAPPAPPLPNSPAAPPGPPAW 313	610 PPPPPCIEPPPPPCIEYSPPPPPPVVHYSSPPPPPVYYSSPPPPPPVHY 669	224 APPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVPVFPTPPGPP 267	551 SPPPPEPYYYSSPPPHSSPPPHSPPPPHSPPPPIYPYLSPP-PPPTPVSSPPPTPVYSP 609	171 TPNPPAPPAPPLENSPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP	495 YSPPPPPPPPPPPVYSPPPPPVYSSPPPPPSPAPTPVYCTRPPPPPPHSPPPQF 550	119 RMPALPPAPPAPPSWEAVAPVPPVPPVPPLPVKMPPSPPVPPFPPAEPE 170	447 PVYSPPPPPPPPPPPPPVYSPPPPPPPPPPPPVYSPPPPSPPPPPPPPV 494	61 AIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPK 118	392 VSPRPPV-VTPLPPPSLPSPPPPAPIFSTPPTLTSPPPPSPPPVYSPPPPPPPPP 446	5 VPPAPPAPPSPINPPVPPVPPLPAAPRTLSPVVPPAPPSPISLAAPPLPPDPPMPP 60	Query Match 31.0%; Score 687; DB 2; Length 760; Best Local Similarity 42.1%; Pred. No. 2.2e-25; Matches 164; Conservative 30; Mismatches 112; Indels 84; Gaps 24;	p position: 4	C;Genetics:	L:AL049608	A; Molecule type: DNA A: Molecule type: DNA		R;Bevan, M.; Pohl, T.; Weizenegger, T.; Bancroft, I.; Mewes, H.W.; Mayer, K.F.X.; submitted to the Protein Sequence Database, April 1999	C:Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 30-Apr-1999 #sequence_revision 30-Apr-1999 #text_change 11-Jun-1999 C:Apcession: T06291	extensin homolog T9E8.80 - Arabidopsis thaliana

```
extensin class 1 pred
C; Species: Vigna ungu
C; Date: 16-Jul-1999 #
C; Accession: Tl1622
R;Arsenijevic-Maksimovic, I.; Broughton, W.J.; Krause, A. Mol. Plant Microbe Interact. 10, 95-101, 1997
A;Title: Rhizobia modulate root-hair-specific expression A;Reference number: Z17301; MUID:97155574
A;Accession: T11622
                                                                                                                                                                                                  RESULT
T11622
                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                          δÕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      extensin-like protein - maize C;Speciles: Zea mays (maize) C;Date: 05-Mar-1995 #sequence_revision 12-May-1995 #text_change 29-Oct-1999 C;Accession: S49915 R;Rubinstein, A.L.; Broadwater, A.H.; Lowrey, K.; Bedinger, P.A. submitted to the EMBL Data Library, June 1994 submitted to the EMBL Data Library, June 1994
                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT
S49915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Description: Pex genes: pollen-specific genes with extensin-like A;Reference number: S49915
A;Accession: S49915
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Cross-references: EMBL:Z34465; NID:g600117; PIDN:CAA84230.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-1188 < RUB>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Status: preliminary
                                                                                                                               xtensin class 1 precursor - cowpea
;Species: Vigna unguiculata (cowpea)
;Date: 16-Jul-1999 #sequence_revision
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                     1061 PPPAPISSPPPPVKSPPPPAPVS----SPPPPVKSPPPPAPVSSPPPPIK 1106
                                                                                                                                                                                                                                                                                                                                                                                                                                                             941
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      524
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                641
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        761
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           59
                                                                                                                                                                                                                         w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PTPVSSPPPPEKSPPPPPAKSTPPPEEXPTPPTSVKSSPPPEKSLPPPTLIPSPPPQE 700
                                                                                                                                                                                                                                                                                                                                                                          MSSPPPPEVKSPPPPAPVSSPPPPVKSPPPPAPVSSPPPPVKSPPPPAPVSSPPPPVKSP
                                                                                                                                                                                                                                                                                                                                                                                                              --SPPAP----PAPPLP-NSPAAP---PGPPAWPGAPDPPA----PPLPYSSPPAPPACP
                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPTVKSSPPPAPVSSPPATPKSSPPPAPVNLPPPEVKSSPPPTPVSSPPPAPKSSPPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SPPAPIGSPSPPPPVSVVSPPPPVKSPPPPAPVGSPPPPEKSPPPPAPVASPPPPVKSPP
                                                                                                                                                                                                                                                                                                                              VPGAPLA--PLPISGRPSNSWVGVFTMLSRPSNGAAAAASALAYAPAPAVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STPPAPTTVISPPSEPKSSPPPTPVSLPPPIVKSSPPPAMVSSPPMTPKSSPPPVVVSSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -MPPAPNSPAAPPSPPS---PPVPVFPTPP----GPPA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PPTL---VASPPPPPVKSPPPPAPVASPPPPVKSPPPPTPVASPPPPAPVASSPPPMKSPP 640
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PPAIWSALEAPNPPV-PPAPPGPNSAPAPPM----PPTPPLPPVPPGSGAPRPVPAVPPM 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SMPVP---PAPPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPM 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APLSSPPLAPKSSPPHVVVSSPPPVVKSSPPPAPVSSPPLTPKPASPPAHVSSPPEVVKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ANTSNSPLR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPSVKSSPPPAPLSSPPPAPQVKSSPPPVQVSSPPPAPKSSPPLAPVSSPPQVEKTSPPP 820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -PPLENSPPPPVPPVPPVPPLTLNPP-----VPPA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KPTPPSTPSKPPSSPEKPSPPKEPVSSPPQTPKSSPPPAPVSSPPPTPVSSPPALAPVSS 760
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -PVPPLPVKMPPSPPVPPFPPAE----PETPN---PPA-----PPA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPAPKRMPALP---PAPPAP-----PSPPTSWLAVPVP------PVP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----PPEPNSSPPA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ------PPAP-PAPPLKPGPPAPP------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    37; Mismatches 149;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 670.5;
Pred. No. 1.
                                                                                                                                 16-Jul-1999 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .5; DB 2;
1.8e-24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels 215;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---PPAPPAAPLPGP
                                            of extensin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PID: g600118
                                                                                                                                    21-Jul-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -PPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             domains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   880
                                                                                                                                                                                                                                                                                                                                                                                                                                                             1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28;
```

```
A; Molecule type: DNA
A; Residues: 1-620 <KEL>
A; Residues: 1-620 <KEL>
A; Cross-references: EMBL:X13885; NID:g19866; PIDN:CAA32090.1; PID:g19867
C; Superfamily: hydroxyproline-rich glycoprotein
C; Keywords: glycoprotein
                                                                                                                                                                                                                                                                                   hydroxyproline-rich glycoprotein precursor - common tobacco C; Species: Nicotiana tabacum (common tobacco) C; Date: 28-Feb-1990 #sequence_revision 28-Feb-1990 #text_change 21-Jul-2000 C; Accession: S06733 R; Keller, B.; Lamb, C.J. Genes Dev. 3, 1639-1646, 1989 A; Title: Specific expression of a novel cell wall hydroxyproline-rich glycoprotein A; Reference number: S06733; MUID:90128263 A; Accession: S06733
  Вþ
                                   QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
S06733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Superfamily: hydroxyproline-rich glycoprotein C;Keywords: glycoprotein; hydroxyproline F;1-23/Domain: signal sequence #status predicted F;24-489/Product: extensin class 1 #status predic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Cross-references: EMBL:X91836; NID:g1015936; A;Experimental source: sub_species Red caloona
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Gene: Ext26G
C;Superfamily:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C; Genetics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Residues: 1-489 < ARS>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
                                                                               Query Match
Best Local S
Matches 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
  169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              205
                                                                               Local Similarity
nes 166; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       86
                                         4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
PSPPSRHGHPPPPTYAQPPPTPIYSPSPQVQP----PPTYSPPPTHVQPTPSPPSRGHQ
                                       PVPPA-----PPA----PPSPINPPVPPVPPLPAAPRTLSPPVP-----PAPPS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     --PPYYYKSPP--PPSPSPP-PPYYYKSPPPPSPSPPP--PYYPYLYNSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAPP----GPPAWPGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLFISGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YKSPPPPSPSPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSPPPPYVYKSPPPPSP-SPPPPYYYKSPPPPSPSPPPPYYYYKSPPPPSPSPSPPPYYYYKS 144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PVPPAP----PAPPSPINPPVP-----PVPPLPAAPRTL---SPPVP-PAPPSPISLAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      preliminary;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---PTPPGP-PAPPEPNSSPPAP-PAPP-----AAPLPGPSPPAP-----PAPPLPNSP 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PSPSPPPPYYYKSP--PPPSPSPPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPPYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    P-PAPPAANTSNSPLRPPAPPAPP----LKPGPPAPPMPPAPNSPAAPPSP-PSPPVPVF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VPPLPVKMPPSPPVPPFPPAEPETPNPPAP-PAPPLENSPPPPVPPVPPVPPLTLNPPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YYKSPPPPSPSPPPPYYYKSPPPPSPSPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --SGAPRPVPAVPP-----MPPAPKRMPALP-----PAPPAPPSPPTSWLAVPVPPVP-P 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PPPPSPSPPPYVYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKSPPPPSPSPPPPY 204
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPLPPDPPMPPAIWSALEAPNPPVPP----APPGPNSAPAPP---MPPTPPLPPVPPG- 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       166;
                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   extensin class 1 #status predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29.7%;
                                                                                                27.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     27;
                                                                                 29;
                                                                               Score 608; DB 2; J
Pred. No. 7.8e-22;
99; Mismatches 138;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 659; DB 2
Pred. No. 3e-24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIDN:CAA62943.1; PID:g1015937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2;
                                                                                                                     Length 620;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 489;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <MAT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           351
                                                                                 112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                               Gaps
                                         43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            264
                                                                                 29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       27;
```

δÃ

44

PISLAAPP----

-LPPDP----

----PMPPAIWSALEAPNPPVP

١,

```
RESULT
T31611
                                                                                                                                                                                                                                                                                                                                                                                                    A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Molecule type: DNA
A;Molecule type: DNA
A;Cross-references: EMBL:ALL17200; NID:e1549770; PIDN:CAB55050.1;
A;Experimental source: clone Y50E8A
A;Experimental source: clone Y50E8A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      submitted to the EMBL Data Library, A; Reference number: Z21047 A; Accession: T31611
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  hypothetical protein Y50E8A.g - Caenorhabditis elegans C;Species: Caenorhabditis elegans C;Species: Caenorhabditis elegans C;Date: 29-Oct-1999 #sequence_revision 29-Oct-1999 #text_change 29-Oct-1999 C;Accession: T31611
R;Steward, C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                    ρy
                                                                                                                                                       Вþ
                                                                                                                                                                                   Qy
                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               γ
Ş
                             Вþ
                                                           δõ
                                                                                          В
                                                                                                                                                                                                                                                                                  Б
                                                                                                                                                                                                                                                                                                            δã
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Дb
                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                          1027
                                576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    135
   159
                                                                                                                           100
                                                                                                                                                                                                                         971
                                                                                                                                                                                                                                                                                    913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  225
                                                                                                                                                                                                                                                   35
                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  75
                                                                                                                                                                                                                                                                                                                2 SMPVPPAPPAPPSPINPPVPPVP-PLPA------APRTLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----APPACPVPGAPLAPLPISGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPP--APPAPPLENSPPPPV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YSPPPPTYSPPPPSYIGPPPAYSPSPPPTPTPTFSPPPPAYSPPPTYSPPPPTYLPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RQPRPPTPTYGQPPSPPTFSPPPPRQIHSPP-PPHWQPRTPTPTYGQPPSPP-TFSAPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPPAPPSPP
                                                                                                                                                                                                                     PPPPPPPPPP----PPPPPPAPAPAPAPASGGYSGGSSGGSAAGGGGGSSGGYSGGSAAP
                                                                                                                                                                                                                                                 PPVPPAPPSPISLAAPPLPPDPPMPPAIWS--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RQIHSPP--PPHRQPRPPTPTYGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PPPAYAQPPPPPTYSPPPPAYSPPPPSPIYSPPPPQVQPLPPTFSPPPPRRIHLPPPPH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APNSPAAPPSPP---SPPVPVF-PTPPGP---PAPPEPNSSPP--APPAPPAAPLPGP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SPPL-PAPP-TYSPPPPTYSPPPPTYAQPPPLPPTYSPPPPAYSPPPPTYSPPPPTYSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --PPVPPVPPLTLNPPVPP-APPAANTSNSPLRPP---APPAPPLKPGPP----APPMP---P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SSPIYSPPPPYYSPPPPPSYSPPPPTYLPPPP--PSSPPPPSFSPPPPPTYEQSPPPPPAY
                                                                                          PAPAPAPASGGYSGGSSGGSAAGGGGGSSGGYSGGSAAPPPPPPPP-----PPPAPAP 1140
                                                                                                                           GSGAPRPVP-----
                                                                                                                                                        NPPVPPAPPGPNSAPAPPM----
                                                                                                                                                                                                                                                                                  SAALPPPPPPPPP---PPPPPAPAPAPASGGYSGASSGGSAAGGGGGSSGGYSGGSAA 970
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PQPPTHRHAPPTHRHAPPTHQPSPLRHLPPSPRRQPQPPTYSPPPPAY---AQSPQPSPT
                                                                                                                                                                                                                                                                                                                                                 184;
                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -SPPAPP--APPLPNSPAAPPGPPAW-PGAP-----DPPAPPLPYSSPP------
                                                                                                                                                                                                                                                                                                                                                              27.4%; 26.2%;
                                                                                                                                                                                                                                                                                                                                                 15;
                                                                                                                                                                                                                                                                                                                                                               Score 608; DB 2;
Pred. No. 1.6e-21;
 -PPVPPFPPAEPETPNPPAPPAPPLENS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     September
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            351
                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                              -WLAVPVPPVPPVPPLPVKMP---PS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1999
                                                                                                                         ---AVPPMPPAPKRMPALPPAPPAP
                                                                                                                                                                                                                                                                                                                                                 122; Indels 382;
                                                                                                                                                                                    -----PPTPPLPPVPP
                                                                                                                                                                                                                                                                                                                                                                             Length 1585;
                                                                                                                                                                                                                                                   --ALEAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CESP:Y50E8A.g
                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           575
                                                                                                                           130
                                1200
                                                                                                                                                        1086
                                                                                                                                                                                                                     1026
   185
                                                              158
                                                                                                                                                                                        99
                                                                                                                                                                                                                                                    69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  281
                                                                                                                                                                                                                                                                                                                                                 25;
```

```
extensin homolog F28A21.80 - Arabidopsis thaliana (;Speciles: Arabidopsis thaliana (mouse-ear cress) C;Date: 23-Apr-1999 #sequence_revision 23-Apr-1999 #text_change 11-Jun-1999 C;Accession: T04859 R;Bevan, M.; Mueller, M.W.; Muendlein, A.; Felber, R.; Bancroft, I.; Mewes,
                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Map position: 4
A; Introns: 623/3
A; Note: F28A21.80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           submitted to the Protein Sequence A; Reference number: Z15387 A; Accession: T04859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                 밁
                                                               Qγ
                                                                                                В
                                                                                                                           Q
                                                                                                                                                                 В
                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                     ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Cross-references: EMI
A; Experimental source:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: DNA
A; Residues: 1-839 <BEV>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 T04859
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q
Ω
                                                                                                                                                                                                                                    Db
                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Genetics:
                                                                                                                                                                                                                                                                                                                                                                        Matches 150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1538
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1309 GGSAAGGGGGSSGGYSGGSAAPPPPPPPPP--PPPPAPAPAPAPASGGYSGGSSGGSAAGG 1366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1201 SGGSSGGSAAGGGGGSSGGYSGGSAAPPPPPPPPP----PPPPAPAPAPAPAPSSGGYSGGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  330
                                   596
 229
                                                                                                                                                                                                                                      426
                                                                                                                                                                                                                                                                                                     370 NCLPARPAQRSPGQCAAFSSLPPVDCGSFGCGRSTRPPVVVPSPPTTPSPGG----SPPS
                                                                                                                                                                                                   97
                                                                                                                                                                                                                                                                    38
                                                                                                                                                                                                                                                                                                                                     GGGSSGGYTGGSAAPPPPPPPPPPPPPPPPPPPPPPPPPSGGYSGGSSGGSAAGGGGGS 1422
                                                                                                                                                                                                                                                      PPAPPS-PISLAAPPLPPDPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PAPPACPVPGAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAA 372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPPPPPPPAPAPAPASGGYSGGSSGGSAAGGGGGSSGGYTGGSAAPPPPPPPP----P
                                 SPPL---PPVIPSPPIVGPTPSSP--PPSTPTPGTLLHPHHLLLPQLSHLPHQYLHHRLR
                                                                  VPPLTLNPPVPPAPPAAN-TSNSPLRPPAPPAP-
                                                                                                                                                                   TPGGSPPSSPTTPTPGGSPPSSPTTPTPGGSPPSSPTTPSPGGSPPSPSISPSPPITVPS
                                                                                                                                                                                                                                  PPPPPAPAP----APAPSSGGYSGG-----SSGGSAA 1565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPAPPLPNSPAAPPGPPA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SGGYSGGSAAPPPPPPAPAPAPAPASGGYSGGSSGGSAAGGGGGSSGGYTGGSAAPPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGGSAAGGGGGSSGGYTGGSAAPPPPPPPPPPPPP-----PPAPAPAPAPSSGGYSGGSS 1308
                                                                                                PPSTPTSPGSPPSSPTPSSPIPSPPTPSTPPTPISPGQNSPPIIPSPPFTGPSPPSSP
                                                                                                                                  PPSPPVPPFPPAEPETPNP----PAPPAP-----PLENSPP----PP---PVPPVPP 196
                                                                                                                                                                                                 VPPGSGAPRPVPAVP-PMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM 155
                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL:AL035526
ve: cultivar Columbia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPAPPAPPAAPLP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PAAPPSPPSPPVPVFPTPPGPPAP-PEPNSS----
                                                                                                                                                                                                                                                                                                                                                                                      25.8%;
30.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SNSPLRPPAPPAPPLKPGPPAPPMPPAPNS-----
                                                                                                                                                                                                                                                                                                                                                                      ; Score 571.5; DB 2;
; Pred. No. 4.6e-20;
36; Mismatches 127;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPPPPVPPVPPVPPLTLNPPVPPAPPAANT------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Database, February 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            clone
   -PL-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              F28A21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -WPGAPDPPAPPLPYSSP
                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                        Indels 175;
   KPGPPAP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPSPPA
                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          245
                                   650
                                                                                                    595
                                                                                                                                                                     535
                                                                                                                                                                                                                                      475
                                                                                                                                                                                                                                                                    96
                                                                                                                                                                                                                                                                                                       425
                                                                                                                                                                                                                                                                                                                                        37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          275
                                                                  228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                H.W.;
                                                                                                                                                                                                                                                                                                                                                                        22;
```

мау

```
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Experimental source: strain Tendergreen C; Superfamily: hydroxyproline-rich glycoprotein C; Keywords: glycoprotein; hydroxyproline F;1-29/Domain: signal sequence #status predicted F;30-580/Product: extensin #status predicted <MAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Accession: T10863
R;Wycoff, K.L; Powell, P.A.; Gonzales, R.A.; Corbin, D.R.; Lamb, C.; Dixor Plant Physiol. 109, 41-52, 1995
A;Title: Stress activation of a bean hydroxyproline-rich glycoprotein promo A;Reference number: Z17192; MUID:96061709
A;Accession: T10863
A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 1-580 <WYC>
A;Cross-references: EMBL:U18791; NID:9727263; PIDN:AAA87902.1; PID:9727264
                                            Ş
                                                                                망
                                                                                                                                                             В
                                                                                                                                                                                                 Ø.
                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                   Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             extensin precursor - kidney bean Alternate names: cell wall protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         pecies: Phaseolus vulgaris (kidney bate: 16-Jul-1999 #sequence_revision
-1
                                              296
                                                                                                                                                                                                     218
                                                                                                                         256
                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                  176
                                                                                                                                                                                                                                                                                                                                                               142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      830
                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      651
                                                                                                                                                                                                                                                                                                                                                                                                                                       95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
                                                                                                                       PVPVF----PTPP-----GPPAPPEPNSSPPAP---PAPPAAPLPGPSPPAP--
                                                                                                                                                                                                                                                                                  APPAPPLENSPPPPPV-----PPV-----PPVPPLTLNPPVPPA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPYYYHSPPPPKHSPPP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NSMPVP---PAPP----APPSPINPPVPPV-----PP--LPAAPRTLSPPVPP--APPS 43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YSSPPAPP
                                                                                                                                                                                                   SPLRP---PAPPAPPLK-PGP------PAPPM-----PPAPNSPAAPPSP---PSP
                                                                                                                                                                                                                                              SPPPPPYKYSSPPPPVYKYKSPPPPVYKYKSPPPPVYKYNSPPPPVYKYKSPPPPVYKYN
                                                                                                                                                                                                                                                                                                                        PPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKNPYKYSSPPPPVYKYKSPPPPYKYP
                                                                                                                                                                                                                                                                                                                                                             VPPVPPVPPLPVKMPPSP---PVPPF-----PPAEP-----ETPNP----P 175
                                                                                                                                                                                                                                                                                                                                                                                                   SPPPPYYYHSPPPPPKHSPPPPPYYYHSPPPPPKHSPPPPPKYYHSPPPPKHSPPPPYYYHSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              РҮҮҮНЅРРРРКНЅРРРРҮҮҮНЅРРРРКНЅРРРРҮҮҮНЅРРРРКНЅРРРРҮҮҮНЅРРРРКН 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PISLAAPPLPPDPPMPPAIWSALEAP-NPPVPP----APPGPNSAPAPP----MPPTPPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SSPQPPPPPHYSLPPPTPTYHYISPPPPPTPIHSPPPQSHPPCIEXSPPPPPTVHYNPPP
                                                                                    PPPVYKYNSPPPPVYKYKSPPPPVYKYKSPPPPYKYPSPPPPPYKYSSPPPPVYKYKSPP
                                                                                                                                                                 SPPPPYKYPSPPPPYKYPSPPPPVYKYKSPPPPVYKYKSPPPPYKYPSPPPPYKYPSP
                                                                                                                                                                                                                                                                                                                                                                                                                                       PPVPP--GSGAPRPVPAVPP-----MPPAPKRMPA-----LPPAPPAPPSPPTSWLAVP 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YASPPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPSPAHYSPPPSPPVYYYNSPPPPPAVHYSPPPPPVIHHSQPPPPPIYEG-PLPPIPGIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PPAPP-AAPLPGP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -- PMPPAPNSPAAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HILPSRHRHLLRRKHTIHRNHLHHNPRNLQFTALPLLPLYLTCRHRLNLASPPPPAPYYY
                                              PAPPLPNSPAAPPGPPAWPGAPDPP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25.8%;
                            ::
=
=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SPPAPPA-----PPLPNSPAAPPGPPAWPGAPDPPAPPLP 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -SPPSPPVPVFPTPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 571; DB 2; Pred. No. 3.7e-20;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       bean)
n 16-Jul-1999 #text_change 21-Jul-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               hydroxyproline-rich glycoprotein
                                              --APPLP---YSSPPAPPACPVPGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      <MAT>
                          <u>:</u>
-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       152;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 580;
                            _
=
_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels 144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -GPPAPPEPNSSPPA
                                                                                                                                                                                                                                                                                  -PPAANTSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                promoter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dixon,
                                                                                                                                                                                                                                                                                  217
                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ı,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                super
```

```
Ş
                                                                          дδ
                                                                                                            Q
                                                                                                                                                 В
                                                                                                                                                                                  ρy
                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                             Q
                                                                                                                                                                                                                                                                                                      Дb
                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                 Вb
                                                                                                                                                                                                                                                                                                                                                                                                                Ş
V
                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Cross-references: EMBL:M76670; NID:g170441; PIDN:AAA34163.1; C;Superfamily: hydroxyproline-rich glycoprotein C;Keywords: cell wall; glycoprotein; hydroxyproline
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Title: Isolation and characterization of A; Reference number: S25298; MUID:92385769 A; Accession: S25298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               extensin (clone Tom J-10) - tomato
C;Species: Lycopersicon esculentum (tom
C;Date: 03-Feb-1994 #sequence_revision
C;Accession: S25298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: DNA
A; Residues: 1-388 <ZHO>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R; Zhou, J.; Rumeau, D.; Showalter, Plant Mol. Biol. 20, 5-17, 1992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
 342
                                   308
                                                                                                               261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                            285
                                                                                                                                                   230
                                                                                                                                                                                        204
                                                                                                                                                                                                                             171
                                                                                                                                                                                                                                                                                                        123
                                                                                                                                                                                                                                                                   156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         541 VYKYKSPPPPV
                                                                                                                                                                                                                                                                                                                                             96
                                                                                                                                                                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                                                                                                                                                                  51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                          7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             4
                                                                                                                                                                                                                                                                                                                                                                                                                                                        PTPYYYKSPPPPSPKYYYKSPPPPSPKYYYKSPPPSPKYYYKSPP----PPSPKYYYKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PVP-----PAPPAPPSPINPPVPPVP-----PLPAAPRTL--SPPVPPAPPSPISLAAP 50
                                 PGPPAWPGAPDPPA----PPLPYSSPPAPPACPVPGAPLAPLPISGRP 351
                                                                                                                                                                                      PPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVPVF---
                                                                                                                                                                                                                                                                                                                                                                                 PPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKS 122
--PPYYYHSPPPPVVAGGGBYYYYGSPPPVKSPPP-----PVYIYGSP
                                                                                                                                                   SPPPPSPKYVYKS-----PPPPPPYYYKSPPPPSPSPPPPPYYYKSPPPPSPSPPPPYYYKS
                                                                                                                                                                                                                                                                 PPSPPVPPFPPAEPETPNP-----PAPPAPPLENSPPPPPVP-----PVPPVPPLTLN 203
                                                                                                                                                                                                                                                                                                        PPPP---SPKYVYKSPP-PPSPKYVYKSPP----PPSPKYVYKS----PPPPPSPKYVYKS 170
                                                                                                                                                                                                                                                                                                                                            PVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM 155
                                                                                                                                                                                                                                                                                                                                                                                                                  PLPPDP-----PMPPAIWSALEAPNPPVP-----PAPPGPNSAPAPPMPPTPPL---P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          25.2%;
ral Similarity 36.5%;
149; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPVYKYKSPPPPYKYPSPPPPPYKYSSPPPPVYKYKSPPPPVYKYKSPPPPVKYPSPPPP
                                                                          PPPPSPSPPPPYYYKSPPPPSPSPPPPYYYKCPPPPSPSPPPPYYYKSPPPPSPSPP---
                                                                                                              PTPPGP-PAPPEPNSSPPAP-PAPP-----AAPLPGPSPPAP-----PAPPLPNSPAAP
                                                                                                                                                                                                                             PP-PPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYKSPPPPSPKYVYK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 558; DB 2;
Pred. No. 1.1e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (tomato)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches 140;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     03-Feb-1994 #text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            two
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            wound-regulated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PID: 9170442
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tomato
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                92;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       21-Jul-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              extensin
                                                                                                                                                                                                                                                                                                                                                                                                                                                        62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 540
                                                                                                                 307
                                                                                                                                                     284
                                                                                                                                                                                        260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  23;
                                                                                                                                                       ٠,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genes
```

extensin - soybean

N;Alternate names: hydroxyproline-rich glycoprotein

C;Species: Glycine max (soybean)

C;Date: 23-Apr-1999 #sequence_revision 23-Apr-1999 #text_change 11-May-2000

C;Accession: T06782

R;Ahn, J.H.; Choi, Y.; Kwon, Y.M.; Kim, S.G.; Choi, Y.D.; Lee, J.S.

Plant Cell 8, 1477-1490; 1996

A;Title: A novel extensin gene encoding a hydroxyproline-rich glycoprotein

**Poeference number: Z15809; MUID:96434536

glycoprotein requires

A; Reference number: Z15809; A; Accession: T06782 A; Status: preliminary; trans

translated from GB/EMBL/DDBJ

A; Molecule t A; Residues:

type: DNA : 1-432 <A

```
A; Accession: TO1456
A; Status: translated from GB/EMBL/DDBJ
A; Molecule type: DNA
A; Residues: 1-786 <SHI>
A; Cross-references: EMBL:AC003113; NID:g2689438;
A; Experimental source: cultivar Columbia
C; Genetics:
A; Map position: 1
A; Note: F2401.18
                                                                                                                                                                                                                                                                                                                                                                                                              extensin homolog F2401.18 - Arabidopsis thaliana C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 12-Feb-1999 *sequence_revision 12-Feb-1999 *C;Accession: T01456 R;Shinn, P.; Buehler, E.; Dewar, K.; Feng, J.; Kim, Sologis, A.; Ecker, J.R. Shitter to the EMBL Data Library, January 1998 P. Description: Genomic sequence for Arabidopsis thal A;Reference number: Z14208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT
T01456
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Cross-references: EMBL:U44838; NID:gl116C;Genetics:
A;Gene: HRGP3
C;Superfamily: proline-rich protein
C;Keywords: glycoprotein; hydroxyproline
                                     Š
                                                                            DЪ
                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                    Query Match
Best Local Similarity
Matches 142; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
   443
                                                                              384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          107
                                       83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{3}{3}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2 SMPVPP--APPAPPSPINPPVPPVPPLPAAPRTLSPPVPP--APPSPISLAAPPLPPDPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VPAVPP----MPPAPKRMPA-----LPPAPPAPPSPPTSWLAVPVPPVPPVPPVPPLPVKM 155
 RATPPPPSSKMSPSVKAYPPPPPPPPEYEPSPP-PPSSEMSPSVRAYPPPPPLSPPPPSPP
                                                                          SPPPPSFKMSPTVRVLPPPPPPSSK-MSPTFRATPPPPSSKMSPSFRATPPPPSSKMSPSF 442
                                                                                                             APPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSALE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLPNSPAAPPGPPAWPGAPDPPAPPLPYSSPPAPPACPVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SPPPPPYK-YPSPPPPVYKYKSPPPPVYKYKSPPPPYKYPSPPPPYKYPSPPPPVYKYK 378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVYKYKSPP------PPYKYPSPPPPPPYKYPSPPPPVKYKSPPPPVKYKSPPPPYKYP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P-----APPAANTSNSPLRPPAPPAPPLK-PGPPAP-----PMPP-----APNSPAAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             РРРРҮҮҮНSРРРРФКНSРРРРРҮҮҮНSРРРРРҮҮҮНSРРРРРКНSРРРРРҮҮҮНSРРРР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MPPAIWSALEAP-NPPVPP----APPGPNSAPAPP----MPPTPPLPPVPP--GSGAPRP
                                     APNPPVPPAPPGPNSAPAPPMPPTP---PLPPVPPGSGAPRPVPAVPPMPPAPKRMPALP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SPPPPYKYPSPPPPPY -- KYPSPPPPVYKYKSPPPPVHSPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SPPSPPVPVFPTPP-----GPPAPPEPNSSPPAP---PAPPAAPLPGPSPPAP----P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PPPPPKKPY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPSPPVPPFPPAEPETPNPPAP-----PAPPLE-NSPPPPVP-PVPPVPPLTLNPPVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYHSPPPPKHSPPPPYYYKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SSPPPPKHSPPPPYYYHSPPPPKHSPPP--PYYYHSPPPPKHSPPPPYYYHSPPPPKHSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 148;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----KYPSPPPPVYKYKSPPPPYKYPSPPPPPYKYPSPPPPVYKYKSPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25.1%;
                                                                                                                                                  24.5%; Score 542; DB 2;
34.9%; Pred. No. 9.9e-19;
tive 33; Mismatches 148;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NID:g1165321; PIDN:AAB53156.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 555.5; DB 2; Pred. No. 1.5e-19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                     thaliana BAC F2401
                                                                                                                                                                                                                                                                                                                        PID:g2781362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 148;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               #text_change 11-Jun-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        c
;;
                                                                                                                                                                                       Length 786;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       338
                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Li,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               81;
                                                                                                                                                    84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sun,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PID:g1165322
                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Η.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
 501
                                     124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conway,
                                                                                                                                                    21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Α.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              င္ပ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Accession: JU0465
R;De Loose, M.; Gheysen, G.; Tire, C.; Gielen, J.; Villarroel, Gene 99, 95-100, 1991
A;Title: The extensin signal peptide allows secretion of a het.
A;Reference number: JU0465; MUID:91216451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C;Keywords: glycoprotein
F;1-21/Domain: signal sequence #status predicted
F;22-416/Product: extensin #status predicted <MAN
Š
                                     Вþ
                                                                      Qγ
                                                                                                             DЬ
                                                                                                                                              QΥ
                                                                                                                                                                                     рь
                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                       Db
                                                                                                                                                                                                                                                                                                                                                                         ρ
                                                                                                                                                                                                                                                                                                                                                                                                                  Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                 οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Gene: ext
C;Superfami
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Cross-references: GB:M34371; NID:g170232; PIDN:AAA34073.1; PID:g170233C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: DNA
A; Residues: 1-416 < DEL>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   extensin precursor - curled-leaved tobacco
C;Species: Nicotiana plumbaginifolia (curled-leaved tobacco)
C;Date: 30-Sep-1991 #sequence_revision 30-Sep-1991 #text_change 21-Jul-2000
C;Accession: JU0465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches 144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Superfamily:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            622
 309
                                                                                                                                                      238
                                                                                                                                                                                       178
                                                                                                                                                                                                                            186
                                                                                                                                                                                                                                                                 134
                                                                                                                                                                                                                                                                                                      127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        741 DSPSNDHHYQTPTPPSLP--PPYYEDTPLPPIRGVSYASPP-PPSIP 784
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 256 PVPVF-----PTPPGPPAPPEPNSSPPAPPA----PPAAPLPGPSPPAPPAPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 125
                                                                                                                                                                                                                                                                                                                                           76
                                                                                                                                                                                                                                                                                                                                                                            89
                                                                                                                                                                                                                                                                                                                                                                                                                    32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                   8 APPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSALE 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PPYIYSSPPPPSPSPPPPYIYSSPPPVVNCPPTTQSPPPPKYEQTPSPREYYPSPSPPYY
GPPAWPGAPDP-PAPPLP-YSSPPAPPACPVPGAPLAPLPISGRP
                                     YHPSPTPYHPSPVYKSPPPPTPVYKSPPPPKKPYHPSPTPYHPAPVYKSPPPPTPVYKSP
                                                                                                             PYHPSPYYKSPPPPTPYYKSPPPPKKPYHPSPTPYHPSPYYKSPPPPTPYYKSPPPPKKP
                                                                                                                                                ----PSP----PSPPAP--NSPAAP-----PSP----PSPPVPVFPTPPGP---
                                                                                                                                                                                       PPPPKKPHYPPHTPVYKSPPPPKKPYYPPHTPVYKSP-PPPTPVYKSPPPPKKPYHPSPT
                                                                                                                                                                                                                          PPPPPVPPVPPVPPLTLNPPVPPA---PPAANTSNSPLRPPAP----PAPPLKPGPPAP-
                                                                                                                                                                                                                                                             TPVYKSPP-----PPTPVYKSPPPPKKPHYPPHTPVYKSP--PPPTPVYKS
                                                                                                                                                                                                                                                                                                  PPAPPSPPTSWLAVPVPPVPPVPPLPV-KMPPSPPVPPFPPAEPETPNPPAPPAPPLENS 1.85
                                                                                                                                                                                                                                                                                                                                         -PHTPVYKSPPPPTPVYKSPPPPKKPHYPPHTPVYKSPPPPTPVYKSPPSPKK-PHYPPH
                                                                                                                                                                                                                                                                                                                                                                           APNPPVPPAPPGPNSA-PAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPA 126
                                                                                                                                                                                                                                                                                                                                                                                                                SPPPPKKPYHP--SPTPYYPA-----PVYKSPPPPTPVYKSPPPPKKPYYP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSPYYYPPVAKSPPPPSPYYYPPVTQSPPPPSTPVEYHPPASPNQSPPPEYQSPPPKGCN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PAPPAANTSNSPLRPPAPPA--PPLKPGPPAPPM--PPAPNSPAAPP-----SPPSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QYTSSPPPPTYYATQSPPPPPPTYYAVQSPPPPPPVYYPPVTASPPPPPVYYTPVIQSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P-----APPAPPSPPTSWLAVPVPPV----PV----PVLPVKMPPSP------PVPPF-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proline-rich protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -PPAEPETPNPPAPPAP---PLENSPPPPPV--PPV---PPVPPLTLNPPV--P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LPNSPAAPPGPPAWPGAPDPPAPPLPYSSPPAPPACP 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             24.1%;
                                                                          -PAPPEPNSSPPAPPAPPAAPLPGPSPPAP--PAPPLPNSPAAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pred. No. 1.6e
l; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 533; DB 2;
Pred. No. 1.6e-18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <MAT>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 416;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             heterologous protein from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R . .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Genetello,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                         133
                                     356
                                                                                                                                                                                                                                                                 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          561
                                                                                                             296
                                                                                                                                                  266
                                                                                                                                                                                       236
                                                                                                                                                                                                                          237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       207
```

c.;

Van

```
R;Goodwin, W.; Pallas, J.A.; Jenkins, G.I. Plant Mol. Biol. 31, 771-781, 1996
A;Title: Transcripts of a gene encoding a A;Reference number: $71558; MUID:96400032
A;Accession: $71558
                                      A;Cross-references: EMBL:X94976; NID:g1155067; PIDN:CAA64425.1; C;Superfamily: hydroxyproline-rich glycoprotein F;1-27/Domain: signal sequence #status predicted <SIG> F;28-376/Product: probable cell wall-plasma membrane linker protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein protein pro
                                                                                                                                                                                                                                                                                                                                                                                                         probable cell wall-plasma membrane linker protein PRP precursor N;Alternate names: hybrid-proline-rich protein C;Species: Brassica napus (rape) C;Date: 27-Nov-1997 *sequence_revision 12-Dec-1997 *text_change
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R;Arsenijevic-Maksimovic, I.; Broughton, W.J.; Krause, A. Mol. Plant Microbe Interact. 10, 95-101, 1997
A;Title: Rhizobia modulate root-hepecific expression A;Reference number: 217301; MUID:97155574
A;Accession: T11671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                extensin-like protein 127 - cowpea (fragment)
C;Species: Vigna unguiculata (cowpea)
C;Date: 16-Jul-1999 #sequence_revision 16-Jul-1999 #text_change 21-Jul-2000
C;Accession: T11671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C; Keywords: cell wall; glycoprotein; hydroxyproline
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: mRNA
A;Residues: 1-280 <ARS>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              T11671
                                                                                                                                                                 Molecule type: DNA
Residues: 1-376 <GOO>
                                                                                                                                                                                                                                                                                                                                                                                     Accession: S71558
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              enetics:
Gene: ext
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Cross-references: EMBL:X86028; NID:g791145; PIDN:CAA60020.1; Experimental source: cultivar Red caloona; root hairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241 PP--PPYVYKSPP--PPSPSPP-PPYVYKSPPPPSPSPPPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             191 VPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAP-PMPPAPNSPAAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              72
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ext127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SPAAPP----GPPAWPGAPDPPAPPLPYSSPPAPPACPVP 338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPPSPSPPPPYVYKSPP-PPSP-----SPPPPYVYKSPPPPSPSPPPPYVYKSPPPPSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PSP-PSPPVP-VFPTPPGPPAPPEPNSSPPAPPAAPLPGPSPPAP-----PAPPLPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPPPYVYKSPPPPSSPSPPPPYVYKSPP-PPSPSPPP--PYVYKSPPPPPPYVYKSPPPP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SPPTSWLAVPVPPVP-PVPPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPPLENSPPPPP 190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPSP-SPPPPYVYKSP-----PPPSPSPPPPPYVYKSPPPPSPSPPPPYVYKS----PP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -SPSPP-PPYVYKSPPPPS------PSPPPPPYVYKSPPPPSPSPPPPPYIYKSP 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPSPSPPPPYVYKSPP-PPSPSPPP-----PYVYKSPP-----PPSPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSALEAPNP 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPPAPP 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPPVKPYHPSPTPYHPAPVYKSP--PPPTPVYKSPPPPTPVYKSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                23.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 520; DB 2;
Pred. No. 4.6e-18;
!1; Mismatches 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     _
                                                                                                                                                                                                                                                                                        putative
                                                                                                                                                                                                                                                                                     cell wall-plasma membrane linker pro-
                                                                                                                                                                                                                                                                                                                                                                                                                  #text_change 20-Jun-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      of
                                         protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      extensin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PID:g791146
                                                                                                                                PID:g1155068
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   78;
                                             PRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 85
                                      #status
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22;
                                      predicte
F:114-180/Region: proline-rich F;216-245/Region: proline-rich F;305-336/Region: proline-rich F;349-357/Region: proline-rich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              , O4
                                                                                                                    F;5-14/Region: proline-rich
F;77-85/Region: proline-rich
                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
A; Residues: 1-162, 'F', 164-817 <MUN>
A; Cross-references: EMBL: X87806; NI
                                                                                                                                                                                          A; Map position:
                                                                                                                                                                                                                       A; Cross-references: SGD:S0004329;
                                                                                                                                                                                                                                                           A; Gene: SGD: VRP1; MDP5;
                                                                                                                                                                                                                                                                                                                  A; Experimental source: strain
                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Accession: S57435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Accession:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Description: The sequence A; Reference number: S51338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       submitted to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R; Du,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     verprolin -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: DNA
A; Residues: 1-817 <DUZ>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Description:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        yeast
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S5134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                           ENDS
                                                                                                                                                                                                                                                                                                                        W303
```

```
A:Molecule type: DNA
A:Rolecule type: DNA
A:Residues: 1-307, 'R',309-349, 'R',351-688, 'E',690-709, 'HLRWIPVPLIAPVKTLNNGYFLQVDRRCNT
A:Cross-references: EMBL:Z26645; NID:g414785; PIDN:CAA81388.1; PID:g439289
R:Munn, A.L.; Stevenson, B.J.; Geli, M.I.; Riezman, H.
submitted to the EMBL Data Library, June 1995
A:Description: end5, end6, and end7: mutations that cause actin delocalization and bl
A:Reference number: S57435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N;Alternate names: prolin-rich protein VRPI; protei C;Specles: Saccharomyces cerevisiae C;Date: 23-Feb-1995 #sequence_revision 11-Aug-1995 C;Accession: S51342; S39626; S57435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Title: A proline rich protein, verprolin, involved in cytoskeletal organization A;Reference number: S39626; MUID:95058201
A;Accession: S39626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Cross-references: EMBL:U19028; NID:g609380; PID:g609392; MIPS:YLR337c R;Donnelly, S.F.H.; Pocklington, M.J.; Pallotta, D.; Orr, E. Mol. Microbiol. 10, 585-596, 1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Status: nucleic acid sequence not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TPPV----VTPP-----TPTPPVVTPPTPTPPKPETCPI 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLPNSPAAPPGPPAWPGAPDPPAPPLPYSSPPAPPACPV 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PAPNSPAAPPSPPSPPVFVFPTPPGPPAPPEPNSSPP--APPAPPAAPLPGPSPP--APP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            P---PPPPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPM--P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STPKPPTKPPTVKPPPSTPKPPTKPPTVKPPPSTPKPPTKP--PTVKPPPSTPKPPTHKP 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPPLENS 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---KPPKPPTKP-PTLKPHPHPKPPTVRPHPHPKPPTKPHPIPKPPTIKP------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SPPKPSPRPHKPPKHPV-----KPPKPPA-----AKPPKPPAV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPAP-PSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PTVCPPPTPTPTPV----VTPPTPPT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EAPNPPVPPAPPGPNSAPAP-PMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPP 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL Data Library,
he sequence of S. c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (Saccharomyces cerevisiae)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  23.3%; Score 516.5; DB 2; 36.4%; Pred. No. 8.3e-18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17; Mismatches
                                                                                                                           NID:g871534; PID:g871535
MIPS:YLR337c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   y, December 1994 cerevisiae cosmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein L8300.13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    115;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --PTPPV--VTPPTPAPPVVTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               #text_change 21-Jul-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein YLR337c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ġ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
```

proline-rich

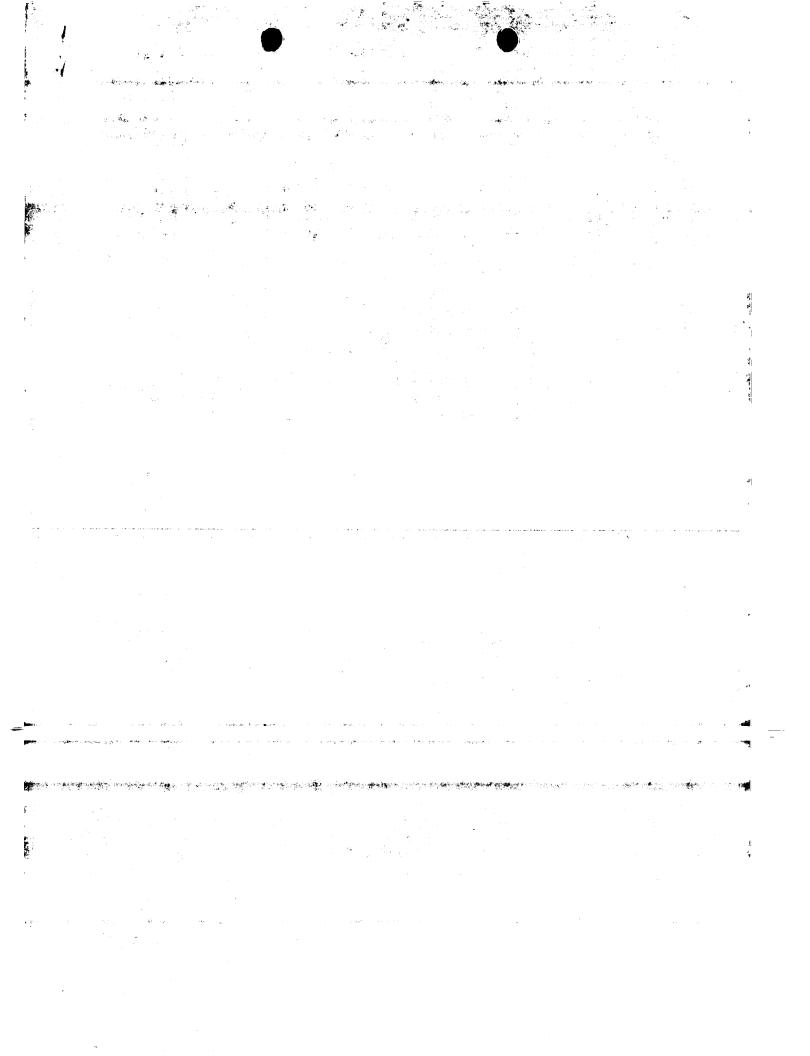
١

```
F;372-382/Region: p
F;396-406/Region: p
F;421-445/Region: p
F;518-528/Region: p
F;567-577/Region: p
F;608-621/Region: p
                            hypothetical protein SPAC23A1.17 - fission yeast (Schizosaccharomyces pombe)
C:Species: Schizosaccharomyces pombe
C:Date: 03-Dec-1999 #sequence_revision 03-Dec-1999 #text_change 03-Dec-1999
C:Accession: T38236
R;Murphy, L.; Harris, D.; Wood, V.; Barrell, B.G.; Rajandream, M.A.
submitted to the EMBL Data Library, February 1998
A;Reference number: Z21780
A;Accession: T38236
A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 1-161 <MUR>
A;Cross-references: EMBL:AL021813; PIDN:CAA16991.1; GSPDB:GN00066; SPDB:SPAC23A1.17
A;Experimental source: strain 972h-; cosmid c23A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Дb
                                                                                                                                                                                                                                                                                                                                                                              õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     F;649-661/Region:
F;678-685/Region:
F;704-710/Region:
               A; Experimental source: strain C; Genetics:
                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                  324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       515 NVRPSPISPSINPPKQSSQNGMSFLDEIESKLHKQTSSNAFNAPPPHTDAMAPPLP--PS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         396
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               337
                                                                                                                                                                                                                                                                                                                                              633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  170
                                                                                                                                                                                                                                                                                                                                                                                                                                                     306 APPGP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          109 AVPPMPPA---PKRMPALPPAPPAPPSPPTSWLAVPVPPV-----PPVPPLPVKMPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  57 PMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPP------GSGAPRPVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SPDB:SPAC23A1.17
                                                                                                                                                                                                                                                                                                                                            AASLLHDVLPSSNLEKPPSPPVAAAP--PLPTFSAPSLPQQSVSTSIPSP
                                                                                                                                                                                                                                                                                                                                                                 -----LPYSSPPAPPACPVPGAPLAPLPISGRPSNSWVGVFTMLSRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NVTSAPKKATSAPAPPPPPPLPAAMSSASTNSVKATPVPPTLAPPL-PNTTSVPPNKASSM 395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INARRSERGAVEGVSSTKIQTENHKSPSQPPLPSSAPPIPTSHAPPLPP--TAPPPPSLP
                                                                                                                                                                                                                                                                                                                                                                                                                  APPPPITSLPTPTASGDDHTNDKSETVLGMKKAKAPALPGHVPPPPVPPVLSDDSKNNVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SSKQSKISSSSSSAVTPGGPLPFLAEIQKKRDDRFVVGGDTGYTTQDKQEDVIGSSKDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----SPPVPPFPPAEPETPNPPAPPAPPLENSPPPPPVP 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SAPPLPSASLPTHVSNPPQAPPPPPTPTIGLDSKNIKPTDNAVSPPSSEVPAGGLPFLAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SASAPPIPGAVPSVAAPPIPNAPLSPAPAVPSIPSSSAPPIPDIPSS----AAPPIP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ------GPS--PP------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PAPPPPPPPPPGAFSTSSALSASSIPLAPLPP-PPPPSVATSVPSAPPPPPTLTTNKPSA 454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PVPPVPPLTLNPPVPPAPP----AANTSNSPLRPPAPP--APPLKPGPPAPPMPPAPNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----IVPSSPAPPLPLSGASAPKVPQ-NRPHMPSVRPAHRSHQRKSSNISLPSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                160;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   proline-rich
proline-rich
proline-rich
proline-rich
proline-rich
proline-rich
proline-rich
proline-rich
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               23.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -PAAPLP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; Score 511; DB 2; Length 817;
; Pred. No. 2.7e-17;
32; Mismatches 146; Indels 252;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     -PAWPG-APDPPAPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----APP-----APPLPNSPA
                                                                                                                                                                                                                                                                                                                                                                                365
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         572
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            56
                                                                                                                                                                                                                                                                                                                                                                                                                                                     323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                24;
```

```
A; Map position:
```

```
δÃ
                                                                       DЬ
                                                                                                        ΩУ
                                                                                                                                             DЬ
                                                                                                                                                                                  δõ
                                                                                                                                                                                                                        Db
                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                   οy
                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
 밁
                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
Matches 139; Conserv
                                                                                                                                               1126 PSVAAPPV-PVPSGAPPVPKPSVAAPPVPAPSGAPPVPKPSVAAPPVPAPSSGIPPVP-- 1182
                                                                                                                                                                                                                          1076
                                                                                                                                                                                                                                                                                                1019 SKAPPVPLPSADAPPIPVPSTAPPV---PIPTSTPPVPKSSSGAPSAPPPVPAPSSEIPS
                                                                                                              210
                                                                                                                                                                                        154
                                                                                                                                                                                                                                                                                                                                                                            959
                                                                                                                                                                                                                                                               97
                                                                                                                                                                                                                                                                                                                                       39
                                                                                                                                                                                                                                                                                                                                                                                                                2
                                                                                                      PPAANTSNSPLRPPAPP----APPL-KPGPPAPPMPPAPNSPAAP-PSPPSPPVPVFPTPP
APPV-PAPSSEAPS-VSTPRSSVPSPHSNASPSPTSSSMASAAP 1277
                                  GPPAPPEPNSSPPAPPAAPPAAPLPGPSPPAPPAPPLPNSPAAPP 308
                                                                         KPAAGV----
                                                                                                                                                                      KMPPSPPVPPFPPAEPETPNP--PAPPAPPLENSPP-PPPVPPVPVP-PLTLNPPVPPA
                                                                                                                                                                                                                       IPAPSGAP-PVPAPSGIPPVPK-----PSVAAPPVPKPS---VAVPPVPAPSGAPPVPK 1125
                                                                                                                                                                                                                                                VPPGSGAPREVPAVPEMPEAPKRMPALEPAPPAPPSPPTSWLAVPVPPVPP----VPPLPV
                                                                                                                                                                                                                                                                                                                                                                          SGPRPAAPPSIPPPLPVSNILSSPTSEPPKDHPPSAPLSKPVSTSPAAPLARVPPVPKLS
                                                                                                                                                                                                                                                                                                                                                                                                             SMPVPPAPPA--PPSPIN------PPV--PPVPPL-----PAAPRTLSPPVP---
                                                                                                                                                                                                                                                                                                                                     -PAPPSPI-SLAAPPLPPDPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                       -PPVPPPSEAPPVPKPSVGVPPVPPPSTAPPVPTPSAGLPPVPV-PTAK 1235
                                                                                                                                                                                                                                                                                                                                                                                                                                                 22.8%; Score 505; DB 2; Length 1611; 40.4%; Pred. No. 8.5e-17; tive 27; Mismatches 116; Indels 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                  1075
                                                                                                                                                                                                                                                                                                                                                                          1018
                                                                                                            264
                                                                                                                                                                                                                                                           153
                                                                                                                                                                                                                                                                                                                                       96
                                                                                                                                                                                                                                                                                                                                                                                                               38
                                                                                                                                                                                                                                                                                                                                                                                                                                                     23;
```

Search completed: Job time: 268 sec January ū 2001, 14:28:47



```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Post-processing: Minimum Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    btal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NO.
        4007
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB DB
                                                                                                                                                                                                                                                              598.5
598.5
570.5
560
560
540.5
528.5
479.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             No. is the number of results predicted by chance to have a greater than or equal to the score of the result being printed, derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Issued_Patents_AA:*

1: /cgn2_6/ptodata/2,

2: /cgn2_6/ptodata/2,

3: /cgn2_6/ptodata/2,

4: /cgn2_6/ptodata/2,

5: /cgn2_6/ptodata/2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query
Match
                        337.55

327.55

327.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00

227.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           174772 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 NSMPVPPAPPAPPSPINPPV.....NGAAAAASALAYAPAPAVKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 January 5, 2001, 14:27:36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-461-774-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
/cgn2_6/ptodata/2/iaa/5COMB.pep:*
/cgn2_6/ptodata/2/iaa/bcTUS_COMB.pep:*
/cgn2_6/ptodata/2/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
      DВ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17957048 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gapext 0.5
US-07-609-716-65
US-08-475-411A-65
US-08-642-255-52
US-09-219-849-4
US-08-642-255-53
US-08-642-255-53
US-08-642-255-63
US-08-642-255-62
US-09-219-849-5
US-08-642-255-62
US-08-642-255-62
US-08-642-255-13
US-08-642-255-10
US-08-642-255-10
US-08-642-255-10
US-08-642-255-10
US-08-642-255-10
US-08-707-237A-75
US-08-477-509B-104
US-08-477-509B-104
US-08-477-509B-104
US-08-477-509B-104
US-08-477-509B-104
US-08-477-509B-104
US-08-642-255-105
US-08-642-255-105
US-08-642-255-105
US-08-642-255-105
US-08-642-255-105
US-08-642-255-105
US-08-642-255-105
US-08-642-255-126
US-08-642-255-126
US-08-642-255-126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Search time 45.19 Seconds (without alignments)
153.384 Million cell updates/sec
  Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Description
65, Appl
32, Appl
33, Appli
53, Appli
53, Appli
66, Appl
66, Appl
66, Appl
66, Appl
66, Appl
67, Appl
68, Appl
68, Appl
68, Appl
68, Appl
68, Appl
69, Appl
69, Appl
60, Appl
60, Appl
60, Appl
610, Appl
```

Db Qy

 Query Match Best Local Sin Matches 169;

h 37.5%; Similarity 46.8%; 69; Conservative

Score 832; DB Pred. No. 7.6e. 5; Mismatches

DB 1; 1 7.6e-46; les 155;

32;

Gaps

11;

Length 40

ATTOREY/AGENT INFORMATION: NAME: ROWLAND, Bertram I REGISTRATION NUMBER: 20015 REFERENCE/DOCKET NUMBER: A.55186-3/BIR TELEPOMMUNICATION INFORMATION: TELEPHONE: 415-781-1989 TELEPAX: 415-381-3249 INFORMATION FOR SEQ ID NO: 65: SEQUENCE CHARACTERISTICS: LENGTH: 408 amino acids TYPE: amino acid STRANDEDNESS: Single TOPOLOGY: linear MOLECULE TYPE: protein US-07-609-716-65	FORM: loppy disk loppy disk PC compatible M: PC-DOS/MS-DOS MILIN Release #1.0, Version ON DATA: BER: US/07/609,716 6.NOV-1990	14581 RMATION: Ferrari, Franco A. Cappello, Joseph NVENTION: Functional Recombinar NVENTION: Synthetic Protein Pol SEQUENCES: 118 ENCE ADDRESS: ENCE ADDRESS: Four Embarcadero Center, Suite an Francisco CA CA	72.5 16.8 826 1 US-U/-838-431- ALIGNMENTS 16-65 65 Application HS/07609716	24.5 19.2 297 2 US-08-580-545E 24.5 19.2 297 3 US-02-653A 11.5 18.6 334 5 5202236-3 10.5 18.5 331 5 5202236-37 03.5 18.2 761 2 US-08-707-237A 03.5 18.2 762 1 US-08-642-255 03.5 18.2 762 1 US-08-97-633A 03.5 18.2 762 1 US-08-97-633A 03.5 18.2 762 1 US-08-99-633A 03.5 18.2 762 1 US-08-99-633A 03.5 18.2 762 1 US-08-99-595- 03.5 18.2 762 1 US-08-99-595- 03.5 18.2 1255 2 US-08-99-595- 390 17.6 1315 3 US-08-99-595- 390 17.6 1315 3 US-08-99-595- 390 17.6 1315 3 US-08-99-595- 390 17.6 1315 3 US-08-819-595- 390 17.6 1315 3 US-08-817-327-327-373 16.8 956 3 US-09-219-846-9
Ę R	sion #1.30	nantly Prepared Polymer Polymer Fritton & Herbert		-6 Sequence 6, Appl -6 Sequence 6, Appl Patent NO. 520223 Patent N

Gaps

11;

59

```
COMPUTER READBLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: IBM PC compatible
COMPUTER: PC-DOS/MS-DOS
SOPTWARE: Patentin Release #1.0, Version #1.30
CURENT APPLICATION DATA:
APPLICATION NUMBER: US/08/475,411A
FILING DATE: 07-UN-1995
CLASSIFICATION DATA:
APPLICATION NUMBER: US 07/609,716
FILING DATE: 06-NOV-1990
PRIOR APPLICATION NUMBER: US 07/269,429
PRIOR APPLICATION NUMBER: US 07/269,429
APPLICATION NUMBER: US 07/114,618
FILING DATE: 09-NOV-1988
PRIOR APPLICATION NUMBER: US 07/114,618
FILING DATE: 29-CCT-1987
PRIOR APPLICATION NUMBER: US 06/927,258
FILING DATE: 04-NOV-1986
ATTORNEY/AGENT INFORMATION:
NAME: TICHGRING NUMBER: 31,801
REFERENCE/DOCKET NUMBER: A-55186-9/RET/MTK
TELECOMMUNICATION INFORMATION:
TELEPHONE: 415-781-1989
INFORMATION TINFORMATION:
TELEPHONE: 415-38-3249
INFORMATION AND SECURIOR SEQUENCE CHARACTERSTICS:
LENGTH: 408 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 2
US-08-475-411A-65
Sequence 65, Application US/08475411A
Patent No. 6140072
Patent INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Ferrari, Franco A.
APPLICANT: Cappello, Joseph
TITLE OF INVENTION: Functional Recombinantly Prepared
TITLE OF INVENTION: Synthetic Protein Polymer
NUMBER OF SEQUENCES: 119
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET: FOUL .....
CITY: San Francisco
STATE: CA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              349 G 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          327 -PGPPGPPGPPGPAGPVGSPGAPGPPGPPGPPGPP-GAPGPPGPPGPPGPPGPAGPVGSP 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPSPPAPPAPPLPNSPAAPPGPPAWPGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPIS 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PLKPGPPAPPMPPAPNSPAAPPSPPSPPVPVFPTPPGPPAPPENSSPPAPPAPPAPPLP 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PAPKRMPALPPAPPAPPASPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETTPNP 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGPPGPPGAPGPPGPPGPPGPPGPAGPV--GSPGAPGPP----GPPGPPGPPGAPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PGPPGPPGPAGPVGSPGAPGPPGPPGPPGAPGPPGPPGPPGPPGPAGPVGSPGAPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PAPPAPPLENSP-----PPPPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGPPGAPG-PPGPPGPPGPP-----GPAGPVGSPGAPGPPGPPGPPGAPGPPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PGPAGPVGSPGAPGPPGPPGPPGAPGPPGPPGPPGPPGPAGPVGSPGAPGPPGPPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PAIWSAL---EAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGS-GAP-RPVPAVPPMP 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      94111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             E: Flehr, Hohbach, Test, Four Embarcadero Center,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Albritton & Herbert
Suite 3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 3
US-08-642-255-32
; Sequence 32, Application US,
; Patent NO. 5773249
; PATENTINFORMATION:
CAPPELLO, JO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Бр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; TYPE: amino acid
STRANDEDNESS: single
; TOPOLOGY: linear
; MOLECULE TYPE: protein
US-08-475-411A-65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best Local Similarity 46.1 Matches 169; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                     ZIP: 94111-4187
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy d
COMPUTER: IBM PC COMP
OPERATING SYSTEM: PC'.
SOFTWARE: PATENTION DATA
APPLICATION UMBER: U
FILING DATE: U
FILING DATE: U
FILING DATE: U
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: CAPPELLO, JO: APPLICANT: FERRARI, FIRI APPLICANT: FERRARI, FIRI TITLE OF INVENTION: High TITLE OF INVENTION: Project of SEQUENCES: 13:
                ATTORNEY/AGENT INFORMATINAME: ROWLAND, Bertral REGISTRATION NUMBER: REFERENCE/DOCKET NUMBER: REFERENCE/DOCKET NUMBER: TELEPHONE: (415) 494-87 TELEPHAX: (415) 494-87
                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES: 13:
CORRESPONDENCE ADDRESS:
ADDRESSE: FLEHR, HOH!
STREET: 4 Embarcadero
CITY: San Francisco
STATE: California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               349 G 349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             385 G 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           327 -PGPPGPPGPPGPAGPVGSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          102 PGPAGPVGSPGAPGPPGPP
                                                                                                                                                       CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                     COUNTRY: USA
ZIP: 94111-4187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4 PVPPAPPAPPSPINPPVPPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPSPPAPPAPPLPNSPAAPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PGPPGPPGPPGAPGPPGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PLKPGPPAPPMPPAPNSPAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PGPPGPPGPAGPVGSPGAPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PAPPAPPLENSP-----PI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PGPPGAPG-PPGPPGPPGPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PAPKRMPALPPAPPAPPSPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAIWSAL - - - EAPNPPVPPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGPPGPPGAPGPPGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      37.5
                                                015
A55556-3/BIR
                                      0 0
                                                                                                                                                                                                                                ble
/MS-DOS
se #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                              H, TEST, ALBRITTON & HERBERT inter, Suite 3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        olecular Weight Collagen-Like
n Polymers
                                                                                                                                                                                              18/642,255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             642255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PGPPGPPGPPGPP-GAPGPPGPPGPPGPPGPAGPVGSP 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PAWPGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPIS 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGPAGPV--GSPGAPGPP----GPPGPPGAPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SPPSPPVPVFPTPPGPPAPPEPNSSPPAPPAPPAPLP 288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGPPGPPGAPGPPGPPGPPGPAGPVGSPGAPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNP 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGAPGPPGPPGPPGPAGPVGSPGAPGPPGPPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPNSAPAPPMPPTPPLPPVPPGS-GAP-RPVPAVPPMP 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GPAGPVGSPGAPGPPGPPGPPGPPGPPGPPGPPGP 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LPA----APRTLSPPVPPAPPSPISLAAPPLPPDPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----GPAGPVGSPGAPGPPGPPGPPGPPGAPGPPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 832; DB 3; I
Pred. No. 7.6e-46;
5; Mismatches 155;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 408;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
```

326

272 228 212 161

밁

밁 Qy Б δõ B Qy 밁 δõ 밁 δõ

289

229 213 162

```
Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δδ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                             ; OTHER INFORMATION: ; OTHER INFORMATION: US-09-219-849-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 4
US-09-219-849-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; MOLECULE TYPE: protein US-08-642-255-32
                                                                                                                     SOFTWARE: PatentIn Ver. 2.1
SEQ ID NO 3
LENGTH: 504
TYPE: PRT
ORGANISM: Artificial Sequence
                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
APPLICANT: VAN HEE
APPLICANT: VAN RIJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 3, Application US/09219849 Patent No. 6150081
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 32.5%;
Best Local Similarity 45.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                    NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                 CURRENT APPLICATION NUMBER: US/09/219,849
CURRENT FILING DATE: 1998-12-23
                                                                                                                                                                                                                                                  FILE REFERENCE:
                                                                                                                                                                                                                                                                TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEX: 910 277299 FHT INFORMATION FOR SEQ ID NO:
                                                                                                             FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121 GPPGPP----GAPGPPGPPGPP----GPPGPAGPVGSPGAPGPPGPPGPPGAPGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   129 APPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPPLENSPPP 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       69 PNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPP 128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26 PPFASDPMGAPGPPGPP-----GPPGPPGAPGP---PGPPGPPGPPGPAGPVGSPGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9 PPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSALEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PNSPAAPPGPPAWPGAPDPPAPPLPYSSPPA 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PVGSPGAPGPPGPPGP---PGPPGAPGPP----GPPGPPGPPGPAGPVGSPGAPGPPGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PPGPPGAPGPPGPPGPPGPAGPVGSPGA 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          P-----PSPPSPPVPVFPTPPGPPAPPEPNSSPPAPPAP--PAAPLPGPSPPAPPAPPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PPGPPGPPGPAGPVGSPGAPGPPG-----PPGPPGPPGAPGPPGPPGPPGPPGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               amino acid
                                                                                                                                                                                                                                                                                                             WIND, RICHELE D.
VAN DEN BOSCH, TANJA J.
                                                                                                                                                                                                                                                                                                                                           MOOBROEK, ANDREAS WERTEN, MARC W.T.
                                                                                                                                                                                                                                                                                                                                                                         VAN RIJN, ALEXIS C.
BOUWSTRA, JAN B.
DE WOLF, FREDERIK A.
                                                                                                                                                                                                                                                                                                                                                                                                                        VAN HEERDE, GEORGE V.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               330 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                                                                                                                                                                                                                                                   2728-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  single
                                                                           amino acid sequence
                                                                                            Description of Artificial Sequence:
                                                                                                                                                                                                                                                                               SILVER HALIDE EMULSIONS WITH RECOMBINANT COLLAGEN SUITABLE FOR PHOTOGRAPHIC APPLICATION AND ALSO TH
                                                                                                                                                                                                                                                                  PREPARATION THEREOF
                                                                                                                                                                                                      50
 27
35
7.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        r UR
32:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5
Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 721;
Pred. No. 5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
598.5; DB
No. 4e-31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 1;
.8e-39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120;
              Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 330;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
              Length
                                                                                             Illustrative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-642-255-52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 52,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches
                                                   TELEFAX: (415) 494-8771
TELEX: 910 277299 FHT UR
INFORMATION FOR SEQ ID NO: 52:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                       REGISTRATION NUMBER: 20,015
REFERENCE/DOCKET NUMBER: A55556-3/BIR
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION: High Molecular Weight Collagen-Like TITLE OF INVENTION: Protein Polymers NUMBER OF SEQUENCES: 135
                                  SEQUENCE CHARACTERISTICS:
                                                                                                                                                                              ATTORNEY/AGENT INFORMATION: NAME: ROWLAND, Bertram I.
                                                                                                                                                                                                                                                                         SOFTWARE: PatentIn Release #1.0, Version #1.30 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      419
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      372 AASALAYAPAPA 383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            377 PPGAPGPAGPP-GAPGPAGPPGAPGPPGAPGP-AGPP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      260 FPTPPGPPAPPEPNSSP--PAPPAPPAAPLP-----GPSPPAPPAPPLPNSPAAPPGPPA 312
                                                                                                                                                                                                                                                                                          MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0
                                                                                                                                                                                                                                                                                                                                                                                                                                       STREET: 4 Embarcadero Center, Suite 3400 CITY: San Francisco
                                                                                                        TELEPHONE:
                                                                                                                                                                                                                    CLASSIFICATION:
                                                                                                                                                                                                                                         FILING DATE:
                                                                                                                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       21
               LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4 PVPPAPPAPPSPINPPVPPVPP-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPGAPDPPAPPLPYSSPPAPPACPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAA 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EPETPNPPAPPAPPLENSPPPPPPPPPPPPPPLTLNPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAP-----RPVPAVPPMPPAP 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APGPAGPPGAPGPAGPPGAPGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAG 376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PAGPKGAHGPAGPKGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAHGPAGPKGAHGPAGPKGAHG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGPPGAPGPAGPPGAPGPAGPP----GAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAG 196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PAGPPG-APGPA 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPP-----VPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KRM-----PALPPAPPAPPSPPTSWLAVPVPPVPPVPPLP----VKMPPSPPVPPFPPA 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PGAPGPAGPPGAPGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               154;
                                                                                                                                                                                                                                                                                                                                                                                      94111-4187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5773249
amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                        California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Application US/08642255
             561 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                         USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FERRARI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CAPPELLO,
                                                                                                            (415) 494-8700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FLEHR, HOHBACH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Franco A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Joseph
                                                                                                                                                                                                                                                        US/08/642,255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ω
``
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TEST, ALBRITTON & HERBERT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     V----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --GAPG 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              14;
```

```
RESULT 6
US-09-219-849-4
Sequence 4, Application US/09219849
Patent No. 6150081
Patent No. 6150081
GENERAL INFORMATION:
APPLICANT: VAN HEERDE, GEORGE V.
APPLICANT: BOUWSTRA, JAN B.
APPLICANT: BOUWSTRA, JAN B.
APPLICANT: MOODROEK, ANDREAS
APPLICANT: WERTEN, MARC W.T.
APPLICANT: WIND, RICHELE D.
APPLICANT: VAN DEN BOSCH, TANJA J.
TITLE OF INVENTION: SILVER HALIDE EMULSIONS WITH RECOMBINANT COLLAGEN
TITLE OF INVENTION: SUITABLE FOR PHOTOGRAPHIC APPLICATION AND ALSO THE
TITLE OF INVENTION: SUITABLE FOR PHOTOGRAPHIC APPLICATION AND ALSO THE
TITLE OF INVENTION: PREPARATION THEREOF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; STRANDEDNESS: single
; TOPOLOGY: linear
; MOLECULE TYPE: protein
US-08-642-255-52
                                                                            CURRENT APPLICATION NUMBER: US/09/219,849
CURRENT FILING DATE: 1998-12-23
NUMBER OF SEQ ID NOS: 50
SOFTWARE: PatentIn Ver. 2.1
SEQ ID NO 4
LENGTH: 720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 27.0%;
Best Local Similarity 35.6%;
Matches 154; Conservative
ORGANISM: Artificial Sequence
FEATURE:
OTHER INFORMATION: Description of Artificial Sequence: Illustrative
OTHER INFORMATION: amino acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AASALAYAPAPA 383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPGAPDPPAPPLPYSSPPAPPACPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAA 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPGAPGPAGPP-GAPGPAGPPGAPGP-AGPP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGP 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAP-----RPVPAVPPMPPAP 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PAGPPG-APGPA 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FPTPPGPPAPPEPNSSP--PAPPAPPAAPLP-----GPSPPAPPAPPLPNSPAAPPGPPA 312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PAGPKGAHGPAGPKGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PPAPPAANTSNSPLRPPAPPALKPGPPAPPMPPAPNSPAAPPSPPSPP-----VPV 259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAHGPAGPKGAHGPAGPKGAHG 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EPETPNPPAPPLENSPPPPPVPPVPPVPPLTLNPP------V 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGPPGAPGPAGPPGAPGPAGPP----GAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAG 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KRM-----PALPPAPPAPPSPPTSWLAVPVPPVPPVPPLP-----VKMPPSPPVPPFPPA 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGP 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PVPPAPPAPPSPINPPVPPVPP-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 598.5; DB 1;
pred. No. 4.4e-31;
3; Mismatches 200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            561;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             75;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GAPG 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4
```

```
RESULT 7

US-08-642-255-53
US-08-642-255-53
Sequence 53, Application US, 6/
Fatent No. 5773249
GENERAL INFORMATION:
APPLICANT: CAPPELLO, JO
APPLICANT: CAPPELLO, JO
APPLICANT: FERRARI, Fra
TITLE OF INVENTION: Hig
TITLE OF INVENTION: Pro
NUMBER OF SEQUENCES: 13
CORRESPONDENCE ADDRESS:
ANDRESSEE: FLEHR, HOH
ZIP: Y4111-410

COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy d

COMPUTER: IBM PC COMP

OPERATING SYSTEM: PC-

SOFTWARE: PATENTIN PC-

SOFTWARE: PATENTIN RE-

CURRENT APPLICATION DATA

APPLICATION NUMBER: U

FILING DATE:

CLASSIFICATION: 1435

ATTORNEY/AGENT INFORMATI

NAME: ROWLAND, Bertital

REGISTRATION NUMBER:

REFERENCE/DOCKET NUMBE

TELECOMMUNICATION INFORM

TELEPAX: (415) 494-97

TELEX: 910 277299 FHT

INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                  ADDRESSEE: FLEHR, HOH
STREET: 4 Embarcadero
CITY: San Francisco
STATE: California
COUNTRY: USA
ZIP: 94111-4187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PPGPPAPPEPNSSP--PAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPAPPMPPAPNSPAAP--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KGAHGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ALAYAPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APGPAGPP-GAPGPAGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APDPPAPPLPYSSPPAPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PAGPPGAPGPAGPPGAPGP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAPGPAGPPGAHGPAGPKG,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPAGPPGAPGPAGPPGAPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NPPAPPAPPLENSPPPPPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AGPKGAHGPAGPKGAPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MPPAPKRMPALPPAPPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PGAPGPAGPPGAPGPAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WSALEAPNPPVPPAPPGPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PGPAGPPGAPGPAGPPGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PVPPAPPAPPSPINPPVPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     al Similarity
145; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             438
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            381
                                                                                                                                                                                                                              MS-DOS
Se #1.0,
                                                                                                                                                                                                                                                                                                                                                                                     H, TE
                                                              00
                                                                                                                 015
                                                                                                                                                                                                 18/642,255
                                                                                                                                                                                                                                                                                                                                                                                                                                                       olecular Weight Collagen-Like
n Polymers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1642255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PAGPPGAPGPAGPPGAHGPAG-----PKGAHGPAGP 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               P-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAAS 374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             :PAGPKGAHGPAGPKGAHGPAGPKGAPGPAGPPGA---PG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PAAPLP----GPSPPAPPAPPLPNSPAAPPGPPAWPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPGAPGPAGPPGAPGPAGPPGAPGPAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETP 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPAGPPGAPGPAGPPGAHGPAGPKGAHGPAGPKGAHGP 149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPMPPTPPLPPVPPGSGAPR-----PVPAVPP 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPPGAPGPAGPPGAPGPAGPPGAPGPAGP 89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PGAPGPAGPPGAPGPPGAPGPAGPPGAPGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPALKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----GAPGPAGPPGAP----GPAGPPGAPGPAGPPGAP
                                                                                                 A55556-3/BIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6; Mismatches 209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 570.5; DB 3; Pred. No. 3.1e-29;
                                                                                                                                                                                                                                                                                                                                                                                     TEST, ALBRITTON & HERBERT
er, Suite 3400
                                                                                                                                                                                                                                Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        720;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11;
```

```
Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-642-255-53
                                                                                                                                                                                                                                                                                                                                                                                      Sequence 66, Appli
                                                                                                                                                                                                                                                                                                                                                                                                                               S-07-609-716-66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
APPLICANT: Ferrar
APPLICANT: Cappel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS:
TOPOLOGY: lin
MOLECULE TYPE:
        SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/07/609,716
FILING DATE: 06-NOV-1990
CLASSIFICATION: 435
CLASSIFICATION: 435
                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                 CORRESPONDENCE ADDRESS:
ADDRESSEE: Flehr, Hohbach, Test,
STREET: Four Embarcadero Center,
                                                                                                                                                                                                                                                                                                      APPLICANT: Cappello, Joseph
TITLE OF INVENTION: Functional Recombinantly Prepared
TITLE OF INVENTION: Synthetic Protein Polymer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS:
LENGTH: 777 amino acids
                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
 ATTORNEY/AGENT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           173 NPPAPPAPPLENSPPPPPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                123 PGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAHGPAGPKGAHGPAGPKGAHGP
                                                                                                                                                                                                   STREET: FOUL CTTY: San Francisco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   465 KGAHGPA 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   375 ALAYAPA 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      263 PPGPPAPPEPNSSP--PAPPAPPAAPLP-----GPSPPAPPAPPLPNSPAAPPGPPAWPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183 AGPKGAHGPAGPKGAPGPAGPP----GAPGPPGAP----GPAGPPGAPGPAGPPGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               113 MPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETP
                                                                                               COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                 COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
mes 145; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63 WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPR-----PVPAVPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  63 PGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGP 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4 PVPPAPPAPPSPINPPVPPVPP-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GAPGPAGPPGAHGPAGPKGAHGPAGPKGAHGPAGPKGAPGPAGPPGA---PG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPPGAPGPAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APDPPAPPLPYSSPPAPPACPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PAGPPGAPGPAGPPGAPGPPGAPGPPGAPGPPGAPGPAGPPGAPGPAGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APGPAGPP-GAPGPAGPPGAPGPAGPPGAHGPAG----
                                                                                                                                                                     94111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         amino acid
                                                                                                                                                                                                                                                                                                                                                                                                             Application US/07609716
                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                            Ferrari, Franco A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25.7%;
                                               US/07/609,716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 570.5; DB 1; Pred. No. 3.3e-29;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches
                                                                                   Version
                                                                                                                                                                                                                                                      Albritton & Herbert
                                                                                                                                                                                                                                      Suite 3400
                                                                                   #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -PKGAHGPAGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11;
```

```
δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; TOPOLOGY: 1; MOLECULE TYPE: US-07-609-716-66
                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-642-255-33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 33, Application US/08642255 Patent No. 5773249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best
                                                                                                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TELEFAX: 415-398-3249
INFORMATION FOR SEQ ID NO:
                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS_MS-DOS
SOFTWARE: PatentIn Release #1.0
                                                                                                                                                                                                                                                                                                                              APPLICANT: FERRARI, Franco A.
TITLE OF INVENTION: High Molecular W
TITLE OF INVENTION: Protein Polymers
                CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                     SOFTWARE: PatentIn Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REFERENCE/DOCKET NUMBER: A-TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            293 PPGPP----GPPGPPGLPGPKGDRGDAGPKGADGSPGP 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 319 PPAPPLPYSSPPAPPACPVP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 244 GLPGPKGDRGDAGPKGADGSP---GPAGPVGSPGAPGPPGPP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                259 VFPTPPGPPAPPEPNSSPPAPPAPPAAPLPGPSPPAPPLPNSPAAPPGPPAWPGAPD
                                                                                                                                                                                                                       CITY: San Francisco
STATE: California
                                                    FILING DATE
                                                               APPLICATION NUMBER:
                                                                                                                                                                                          ZIP:
                                                                                                                                                                                                         COUNTRY:
                                                                                                                                                                                                                                                           STREET:
                                                                                                                                                                                                                                                                          ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          75 AGPKGADGSPGPAGPVGSPGAPG-----PPGPPGPPGPP----GAPGPPGPPGPPGPPGL 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24 AHPPFASDP-----MGAPGPPGPPGPPGPPGAPGPPGPPGPPGPPGLPGPKGDRGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   48 AAPPLPPDPPMPPAIWSALEAPNPPVPPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPR-- 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NAME: Rowland, Bertram REGISTRATION NUMBER: 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LENGTH:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PGPKGDRGDAGPKGADGSPGPAGPVGSPGAPGPPGPPGPPGPPGPPGPPGPPGPPGP--P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVP 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGPKGDRGDAGPKGADGSPGPAGPVGSPGAPGPPGPPGPPGPPGPPGPPGPPGPPGPPGPPGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----PVPAVP-PMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    131;
                                                                                                                                                                                          94111-4187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         amino acid
ROWLAND, Bertram
                                                                                                                                                                                                                                                             4 Embarcadero Center,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         357 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 415-398-3249
                                                                                                                                                                                                          USA
                                                                                                                                                                                                                                                                                                                                                                                   CAPPELLO,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               415-781-1989
                                                                                                                                                                                                                                                                             FLEHR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ------PSPPVPPFPPAEPETPNPPAPPAPPLENSPPPPPVPPVPPVP 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    25.3%;
38.8%;
                                                                                                                                                                                                                                                                                                                                             Franco A.
High Molecular Weight Collagen-Like
                                                                                                                                                                                                                                                                             нонвасн,
                                                                                                                                                                                                                                                                                                                  135
                                                                                                                                                                                                                                                                                                                                                                                   Joseph
                                                                   US/08/642,255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               66:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A-55186-3/BIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 560; DB 1;
Pred. No. 7.7e-29;
                                                                                                                                                                                                                                                           TEST, ALBRITTON & HERBERT er, Suite 3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAPLAPLP 346
                                                                                                     Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      126;
                                                                                                     #1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 357;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -GPPGP---PGAPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1.85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 74
```

```
Patent NO. 614vv.r.

GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: Ferrari, Franco A.
APPLICANT: Cappello, Joseph
ITITLE OF INVENTION: Functional Recombinantly Prepared
ITITLE OF INVENTION: Synthetic Protein Polymer
NUMBER OF SEQUENCES: 119
CORRESPONDENCE ADDRESS: 119
CORRESPONDENCE ADDRESS:
STREET: Four Embarcadero Center, Suite 3400
STREET: Four Embarcadero Center, Suite 3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 10
US-08-475-411A-66
Sequence 66, Application US/08475411A
Sequence 100. 6140072
Septemt No. 6140072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; TOPOLOGY: 1:
; MOLECULE TYPE:
US-08-642-255-33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REGISTRATION NUMBER: 20,015
REFERENCE/DOCKET NUMBER: A5556-3/BIR
TELECOMMUNICATION INFORMATION:
TELEPHONE: (415) 494-8700
TELEPAX: (415) 494-8771
TELEX: 910 277299 EHT UR
INFORMATION FOR SEQ ID NO: 33:
SEQUENCE CHARACTERISTICS:
LENGTH: 357 amino acids
TYPE: amino acids
TYPE: amino acids
STRANDEDNESS: single
      STREET: FOUR Embarcadero Center, Suite 3400
STRATE: CA
COUNTRY: San Francisco
STATE: CA
COUNTRY: US
ZIP: 94111
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/475,411A
EILING DATE: 07-JUN-1995
CLASSIFICATION: 435
PRIOR APPLICATION DATA:

PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 25.3%;
Best Local Similarity 38.8%;
Matches 131; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         106 ------PVPAVP-PMPPAPKRMPALPPAPPSPPTSWLAVPVPPVPPVPPLPVKM 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             293 PPGPP----GPPGPPGLPGPKGDRGDAGPKGADGSPGP 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 244 GLPGPKGDRGDAGPKGADGSP--GPAGPVGSPGAPGPPGPP-----GPPGP---PGAPG 292
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PPAPPLPYSSPPAPPACPVP-----GAPLAPLP 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P------PSPPVPPFPPAEPETPNPPAPPAPPLENSPPPPPVPPVPPVP 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGPKGADGSPGPAGPVGSPGAPG-----PPGPPGPPGPP----GAPGPPGPPGPPGPPGL 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VEPTPPGPPAPPEPNSSPPAPPAPPAPPLPGPSPPAPPLPNSPAAPPGPPAWPGAPD 318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PGPKGDRGDAGPKGADGSPGPAGPVGSPGAPGPPGPPGPPGAPGPPGPPGPPGPPGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein
us 07/609,716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 560; DB 1; Length 357; Pred. No. 7.7e-29; 7; Mismatches 126; Indels
                                                                                                                                                               . 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12;
                                                                                                                                                                                                                                                                                                                        RESULT 11
US-09-219-849-5
; Sequence 5, Application US/
; Patent No. 6150081
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     рЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; TYPE: amino acid
; STRANDEDNESS: sir
; TOPOLOGY: linear
; MOLECULE TYPE: prot
US-08-475-411A-66
               APPLICANT: VAN HEERDE, GE
APPLICANT: VAN RIJN, ALEX
APPLICANT: BOWSTRA, JAN
APPLICANT: BOWSTRA, JAN
APPLICANT: DE WOLF, FREDE
APPLICANT: WOOBROEK, ANDR
APPLICANT: WERTEN, MARC W
APPLICANT: WIND, RICHELE
APPLICANT: VAN DEN BOSCH,
TITLE OF INVENTION: SILVE
TITLE OF INVENTION: SULTA
TITLE OF INVENTION: PREPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
Matches 131; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEPHONE: 415-781-198
TELEPAX: 415-398-3249
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 357 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PELLING DATE: 06-NOV-19
PRIOR APPLICATION DATA:
APPLICATION UNMBER: US
APPLICATION UNMBER: US
PRIOR APPLICATION NOWNER:
PRIOR APPLICATION NOWNER: US
PRIOR APPLICATION DATA:
APPLICATION UNMBER: US
PRIOR APPLICATION UNMBER: US
PRIOR APPLICATION UNMBER: US
PRIOR APPLICATION NUMBER: US
PRIOR MARE: TIFECRAMIC DATE: 04-NOV-15
ANTORNEY_AGENT INFORMATION
NAME: TIFECRAMIC NUMBER: REGISTRATION UNMBER: REGISTRATION 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     244 GLPGPKGDRGDAGPKGADG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          48 AAPPLPPDPPMPPAIWSALI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPAPPLPYSSPPAPPACPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPGPP----GPPGPPGLPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VFPTPPGPPAPPEPNSSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PGPKGDRGDAGPKGADGSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PLTLNPPVPPAPPAANTSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PGPKGDRGDAGPKGADGSP(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AGPKGADGSPGPAGPVGSP(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ----PVPAVP-PMPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AHPPFASDP-----MC
                                                                                                                                                                                                                                                                                                                     INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ss: single
linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protein
                  INJA J.

IALIDE EMULSIONS WITH RECOMBINANT COLLAGEN
FOR PHOTOGRAPHIC APPLICATION AND ALSO THE
TION THEREOF
                                                                                                                                                                                                                                                                C E
                                                                                                                                                                                                                                                                                                                                                                                19849
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DRGDAGPKGADGSPGP 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPAAPLPGPSPPAPPAPPLPNSPAAPPGPPAWPGAPD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVP 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       G----PPGPPGPPGPP----GAPGPPGPPGPPGL 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B01
A-55186-9/RFT/MTK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPVGSPGAPGPPGPPGPPGAPGPPGPPGPPGP--P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPVGSPGAPGPPGPPGPPGAPGPPGPPGPPGL 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GPPGPPGPPGAPGPPGPPGPPGLPGPKGDRGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPR-- 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----GAPLAPLP 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -GPAGPVGSPGAPGPPGPP----GPPGP---PGAPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VPPFPPAEPETPNPPAPPAPPLENSPPPPPVPPVPPVP 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             7/114,618
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7/269,429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5/927,258
                                                                                                                                                                                                              ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 560; DB 3; Length 357
Pred. No. 7.7e-29;
7; Mismatches 126; Indels
                                                                                                                                                                                                                                                                                               <
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           74
```

δÃ ₽ Qy 밁 δÃ 밁 Qy 멍 Qy 멍

```
В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-08-642-255-62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-219-849-5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 62, Application US/08642255 Patent No. 5773249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE: PatentIn Ver. 2.1
SEQ ID NO 5
LENGTH: 960
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION NUMBER: US/09/219,849
CURRENT FILING DATE: 1998-12-23
NUMBER OF SEQ ID NOS: 50
COUNTY,
2IP: 94111-410,
2IP: 94111-410,
COMPUTER READABLE FORM:
COMPUTER READABLE FORM:
COMPUTER: IBM PC compatible
COMPUTER: COMPUTER: PC-DOS/MS-DOS
COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUTER: COMPUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FEATURE:
OTHER INFORMATION: Description of Artificial Sequence: Illustrative OTHER INFORMATION: amino acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM: Artificial Sequence
                                                                                                                                                                                                                                                                                                                                         APPLICANT: CAPPELLO, Joseph
APPLICANT: FERRARI, Franco A.
TITLE OF INVENTION: High Molecular Weight Collagen-Like
TITLE OF INVENTION: Protein Polymers
NUMBER OF SEQUENCES: 135
                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   142
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     284 AAPLP-GPSPPAPPAPPLPNSPAAPPG---PPAWPGAPDPPAPPLPYSSPPAPPACP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            192
                                                                                                                                                                          COUNTRY:
                                                                                                                                                                                                                                                              STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                               ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          7 PAPPAPPSPINP-----PVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPA 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAPGPAGPPGSRDPGPPGAPGPAGPPGSRDPGPPGAPGPAGPPGSRDPGPPGAPGPAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SRDPGPPGAPGPAGPPGSRDPGPPGAHGPAGPKGAHGPAGPKGAHGPAGPKGAHGPAGPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     --EPETPNPPAPPAPPLENSPPPPPV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PAGPPGSRDPG-PPGAPGPAGPPGS--RDPGPPGAPGPAGPPGSRDPGPPGAPGPAGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IWSALEAPNPPVPPA--PPGPNSAPAP------PMPPTPPLPPVPPGSGAPRPVPAVP 111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPGSRDPGPPGAPGP-AGPPGSRDPG-----PPGAHGPAGPKGAHGPA 477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----VPGAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAASALAYAPA 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAPGPAGPPGSRDPGPPGAPGPAGPPGSRDPGPPGAPGPAGP--PGSRDPGPPGAPGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSRDPGPPGAPGPAGPPGSRDPGPPGAPGPAGPPGSRDPGPPGAPGP-AGPPGSRDPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----PMPPAPNSPAAP----PSPPSPPVPVFP---TPPGPPAPPEPNSSPPA--PPAPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -PPVPPVPPLTLNPPVPPAPPAANT--SNSPLRPPAP-----PAPPLKPGPPAP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPVPPLPVKM----PPSPPVPPFPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PGPPGAPGPAGPPGSRDPGPPGAPGPPGSRDPGPPGAPGP---AGPPGSRDPG-PPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         164;
                                                                                                                                                                                                                                      San Francisco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                  California
                                                                                                                                                                                                                                                              E: FLEHR, HOHBACH,
4 Embarcadero Cent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APGPAGPPGSRDPGPPGAPGPAGPPGSRDPGPPGAPGPPGSRDPGPPGAPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24.48;
34.98;
                                                                                                                                                                                                                                                              Center,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 540.5; DB 3; Pred. No. 3e-27;
                                                                                                                                                                                                                                                                 TEST, ALBRITTON er, Suite 3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
     Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180;
                                                                                                                                                                                                                                                                                         & HERBERT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                54
```

```
RESULT 13
US-08-642-255-132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-08-642-255-62
                                                                                                                                                                                                           Sequence 132, Application US/08642255 Patent No. 5773249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELEFAX: (415) 494-8771
TELEX: 910 277299 FHT UR
INFORMATION FOR SEQ ID NO: 62:
SEQUENCE CHARACTERISTICS:
LENGTH: 1064 amino acids
                                                                                                                                                                                         GENERAL INFORMATION;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRANDEDNESS:
TOPOLOGY: lin
MOLECULE TYPE:
                                                             NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
                                                                                                    APPLICANT: CAPPELLO, Joseph
APPLICANT: FERRARI, FRANCO A.
TITLE OF INVENTION: High Mole
TITLE OF INVENTION: Protein P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CURRENT APPLICATION DATA:
ADDRESSEE:
STREET: 4
CITY: San
                                                                                                                                                                                                                                                                                                                                       471 AGPPG---
                                                                                                                                                                                                                                                                                                                                                                             348 SGRPSNSWVGVFTMLSRPSNGAAAAASALAYAPAPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                263 PPGPPAPPEPNSSPP---APPAPPAAPLPG-----PSPPAPPAPPLPNSPAAPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7 PAPPAPPSPINPPVPPVPPLPAAP----RTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                AWPGA------PDPPAPPLPYSSP-----PAPPACP------VPGAPLAPLPI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APGPAGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPGAHGPAGPKGAHGPAGPKGAHGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                        GAPGPAGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPGAPGPPGSRGDPGPPGAPGP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DPGPPGAPGP-AGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPGAPGPPGSRGDPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PKGAHGPAGPKGAPGPAGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPGAPGPAGPPGSRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPAANTSNSPLRPPAPPALK---PGPPAPPMPPAPNSPAAPPSPPSPPVPVFPT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PGPPGAPGPAGPPGS-RGDPGPPGAPGPAGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ALPPAPPAPPSPTSWLAVPVPPVPPVLPVKM-----PPSPPVPPFPP---AEPETPN 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PGSRGDPGPPGAPGPAGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPGAPGPAGPPGSRGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGS-GAPRPVPAVPPMPPAPKRMP 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PGPAGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPGAPGPAGPPGSRGDPGPPGAPGPAGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               amino acid
  San Francisco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ROWLAND, Bertram
                 4 Embarcadero Center,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (415) 494-8700
(415) 494-8771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     linear
                   FLEHR, HOHBACH, TEST, ALBRITTON Embarcadero Center, Suite 3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       single
                                                                                                                                                                                                                                                                                                                                     SRGDPGPPG----APGPA 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23.8%;
                                                                                                      High Molecular Weight Collagen-Like Protein Polymers
                                                                                     135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US/08/642,255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20,015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A55556-3/BIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 528.5; DB 1; Pred. No. 1.8e-26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 200;
                                                                                                                                                                                                                                                                                                                                                                               383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 1064;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    262
```

```
NAME: ROWLAND, Bertram I.

REGISTRATION NUMBER: 20,015
REFERENCE/DOCKET NUMBER: A555:
TELECOMMUNICATION INFORMATION:
TELEPHONE: (415) 494-8771
TELEFA: (115) 494-8771
TELEX: 910 277299 FHT UR
INFORMATION FOR SEQ ID NO: 132:
SEQUENCE CHARACTERISTICS:
LENGTH: 829 amino acids
TYPE: amino acids
TYPE: amino acids
TYPE: amino acids
TYPE: mino acid
STRANDEDNESS: single
TOPOLOGY: Linear
MOLECULE TYPE: protein
US-08-642-255-132
RESULT 14
US-08-397-633A-53
; Sequence 53, Application US/08397633A
; Patent No. 5773577
; GENERAL INFORMATION:
•; APPLICANT: Cappello, Joseph
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ZIP: 94111-4187

COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/642,255
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: ROWLAND, Bertram I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               367 LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQG 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         , Match 21.6%; Score 479.5; DB 1; Local Similarity 33.7%; Prod. No. 1.8e-23; nes 145; Conservative 19; Mismatches 191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VPAVPPMP--PAPKRMPALPPAP--PAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVP 162
                                                                                                                                                                                                                                        DPGRYHMAAK 789
                                                                                                                                                                                                                                                                                             WVGVFTMLSR 364
                                                                                                                                                                                                                                                                                                                                                                                           --PGPPAWPGAPDPPAPPLPYSSP------PAPPACP-VPGAPLAPLP--ISGRPSNS 354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        --PFPPAEPETPNPPAPPAPP-LENSPPPPPVP-----PVPPVPPLTLNPPVPPAPPAAN 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MPVPPAPPAPPSPINPPVPP------VPPLPAAPRTLSP-----PVPPAPPSPIS 46
                                                                                                                                                                                                                                                                                                                                                      GTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAM 775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP 659
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TSNSPLRPPAPPAPPLKPGPPA-PPMPPAPNSPAAPPSPPSPPVPVFPTP-----PGPP 267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGS-----PGAPGTPGPQGLPGSPGAP 539
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LAAPPLPPDPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRP 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              California
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A55556-3/BIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length 829;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ATTORNEY/AGENT INFORMATIC
NAME: ROWLAND, BETTERS
REGISTRATION NUMBER:
REGISTRATION NUMBER:
REGISTRATION NUMBER:
TELECOMMUNICATION INFORM
TELEPHONE: (415) 781-
TELEFAY: (415) 398-32.
TELEX: 910 277299
INFORMATION FOR SEO ID NO:
SEQUENCE CHARACTERISTICS
LENGTH: 829 amino acid
TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: protein
US-08-397-633A-53
                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                 ρy
                                                                                                                                                                                                                                                                                                                                                                                 р
                                                                                                                                                                                                                                                                                                                                                                                                                                  ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ф
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 21.
Best Local Similarity 33.
Matches 145; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy d.
COMPUTER: IBM PC compi
OPERATING SYSTEM: PC-1
SOFTWARE: Patentin Re.
CURRENT APPLICATION DATA
APPLICATION NUMBER: UI
FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADDRESSEE: FLEHR, HOHI STREET: 4 Embarcadero CITY: San Francisco STAFE: California COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TITLE OF INVENTION:
TITLE OF INVENTION:
NUMBER OF SEQUENCES:
CORRESPONDENCE ADDRE
                                                                                                                                                                                                                                                                   660
                                                                                                                                                                                                                                                                                                                                                                                    600
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   487
                                                                                      355 WVGVFTMLSR 364
                                                                                                                                                                                                                                                                                                                           268
                                                                                                                                                                                                                                                                                                                                                                                                                                         215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  367
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      47
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3 MPVPPAPPAPPSPINPPVF
                                    DPGRYHMAAK 789
                                                                                                                                                     GTPGPQGLPGSPGAPGTPG
                                                                                                                                                                                                          --PGPPAWPGAPDPPAPPL
                                                                                                                                                                                                                                                                   GTPGPQGLPGSPGAPGTPG
                                                                                                                                                                                                                                                                                                                           APPEPNSSPPAPPAP----
                                                                                                                                                                                                                                                                                                                                                                                 GTPGPQGLPGSPGAPGTPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GTPGPQGLPGSPGAPGTPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    --PFPPAEPETPNPPAPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LPGSPGAPGTPGPQGLPGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VPAVPPMP - - PAPKRMPAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LPGSPGAPGTPGPQGLPGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LAAPPLPPDPPMPPAIWSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LPGSPGAPGTPGPQGLPGS
                                                                                                                                                                                                                                                                                                                                                                                                                                         TSNSPLRPPAPPAPPLKPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROI
OF 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9 NO:
                                                                                                                                                  ILPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAM 779
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ble
/MS-DOS
                                                                                                                                                                                                          SP-----PAPPACP-VPGAPLAPLP--ISGRPSNS
                                                                                                                                                                                                                                                                   LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP
                                                                                                                                                                                                                                                                                                                     ----PAAP-LPGP-----SPPAPPAP---PLPNSPAAP 307
                                                                                                                                                                                                                                                                                                                                                                                 LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                      \-PPMPPAPNSPAAPPSPPSPPVPVFPTP-----PGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 479.5; DB 1;
Pred. No. 1.8e-23;
19; Mismatches 191;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENSPPPPPVP-----PVPPVPPLTLNPPVPPAPPAAN 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PGTPGPQGLPGS-----PGAPGTPGPQGLPGSPGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P--PAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVP 162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQG 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       18/397,633A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQG 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ------VPPLPAAPRTLSP-----PVPPAPPSPIS
```

Length Indels

75;

Gaps

18;

46

Qy В δõ Дb Qy Db QΥ

354 719 659 267 599 539

δÃ В Š Ş

nter, Suite 3400 015 A-58848-1/BIR PROP-011-1 TS COMPRISING SUBSTRATESCAPABLE YMATIC CROSS-LINKING se #1.0, Version

```
LENGTH: 837 amino acid
TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: peptide
US-08-175-155-68
                                                                                                                                                                                                                                         Qγ
                                           Qy
                                                                                                Вb
                                                                                                                                           Qy
                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                               δõ
                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              õ
       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 15
US-08-175-155-68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 68, Application US/08175155 Patent No. 5641648 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: IBM PC compatible

COMPUTER: IBM PC compatible

OPERATING SYSTEM: PC-DOS/MS-DOS

SOFTWARE: Patentin Release #1.0, Version #1.30

CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/08/175,155

FILING DATE: 29-DEC-1993

CLASSIFICATION: 435

ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TELEFAX: 415-398-3249
INFORMATION FOR SEQ ID NO: 68:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME: Rowland, Bertram I.
REGISTRATION NUMBER: 20015
REFERENCE/DOCKET NUMBER: A-
TELECOMMUNICATION INFORMATION:
TELEPHONE: 415-781-1989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Ferrari, Franco A.
APPLICANT: Cappello, Joseph
APPLICANT: Crissman, John W.
APPLICANT: Dorman, Mary A.
TITLE OF INVENTION: Methods for Preparing Synthetic
TITLE OF INVENTION: Repetitive DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                   217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES:
                                                                                                     277
                                                                                                                                                                                                                                                                                                    164
337 GTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP
                                                                                                                                                                                                                                               163 --PFPPAEPETPNPPAPPAPP-LENSPPPPPPPP-----PVPPVPPLTLNPPVPPAPPAAN 214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STATE: CA
COUNTRY: US
ZIP: 94111
                                                268 APPEPNSSPPAPPAP------PAAP-LPGP----SPPAPPAP---PLPNSPAAP 307
                                                                                                                                                                                                                                                                                                                                               107 VPAVPPMP--PAPKRMPALPPAP--PAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVP 162
                                                                                                                                                                                                                                                                                                                                                                                                104 LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQG 163
                                                                                                                                                                                                                                                                                                                                                                                                                                                  47 LAAPPLPPDPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRP 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   44 LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQG 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STREET: Four Embarca
CITY: San Francisco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE: Flehr, Hohbach, Test, Albritton & Herbert STREET: Four Embarcadero Center, Suite 3400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3 MPVPPAPPAPPSPINPPVPP------VPPLPAAPRTLSP-----PVPPAPPSPIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Match 21.6%; Score 478; DB 1; Length 837;
Local Similarity 34.6%; Pred. No. 2.2e-23;
es 140; Conservative 17; Mismatches 178; Indels 70;
                                                                                                                                              TSNSPLRPPAPPAPPLKPGPPA-PPMPPAPNSPAAPPSPPSPPVPVFPTP-----PGPP 267
                                                                                                                                                                                                   GTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP 276
                                                                                                GTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGSPGAP 336
                                                                                                                                                                                                                                                                                                    LPGSPGAPGTPGPQGLPGSPGAPGTPGPQGLPGS------PGAPGTPGPQGLPGSPGAP 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                837 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A-55186-5/BIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                46
```

Search completed: January 5, 2001, 14:27:39 Job time: 231 sec

×

```
Run
                                                                                                                                                                                                                                                                                                                                                                                           Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         otal number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                               ŏ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A_Geneseq_36:*

1: /SIDS1/gcgda/
2: /SIDS1/gcgda/
3: /SIDS1/gcgd/
4: /SIDS1/gcg/
6: /SIDS1/gc/
5: /SIDS1/gc/
6: /SIDS1/gc/
6: /SIDS1/gc/
7: /SIDS1/gc/
8: /SIDS1/gc/
10: /SIDS1/gc/
10: /SIDS1/gc/
11: /SIDS1/gc/
11: /SIDS1/gc/
11: /SIDS1/gc/
12: /SIDS1/gc/
13: /SIDS1/gc/
14: /SIDS1/gc/
14: /SIDS1/gc/
14: /SIDS1/gc/
14: /SIDS1/gc/
15: /SIDS1/gc/
16: /SIDS1/gc/
17: /SIDS1/gc/
18: /gc/
19: /gc/
20: /gc/
21: /gc/
21: /gc/
21: /gc/
22: /gc/
22: /gc/
23: /gc/
24: /gc/
25: /gc/
26: /gc/
27: /g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9
0
1:
        111
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                         1065.5
1065.5
832
721
                         598.5
598.5
598.5
570.5
570.5
570.5
                                                                                                                                                                                                                                                                                                                                                               Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           length:
length:
  48.1
37.5
32.5
27.0
27.0
27.0
27.0
25.7
25.7
25.7
                                                                                                                                                                                                                                                                                                                                                               Match
                                                                                                                                                                                                                                                                                                                                                                                           Query
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Minimum Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SIDS1/gcgdata/geneseq/geneseqp/AA1980.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1981.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1982.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1983.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1985.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1985.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1985.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1987.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1989.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1999.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1993.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1993.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1993.DAT:

SIDS1/gcgdata/geneseq/geneseqp/AA1995.DAT:

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  268485 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-461-774-10
2216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              January
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version 4.5
Copyright (c) 1993 - 2000 Comp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NSMPVPPAPPAPPSPINPPV......NGAAAAASALAYAPAPAVKV 386
                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
20000000000
572
763
408
330
561
561
777
777
777
777
777
777
357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <u>ر</u>
                                                                                                                                                                                                                                                                                                                                                               DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2001, 14:26:45 ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34193795 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gapext 0.
     18
12
14
14
14
17
17
17
17
19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           80
                                                                                                                                                                                                                                                                                                                                                               IJ
W31855
W31852
W37539
W577645
R37739
R93249
W57650
R37740
R37740
R93250
W57651
R95115
                                                                                                                                                                                                                                                                                                                                                                                                                                               SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Search time 62.98 Seconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (without alignments)
209.571 Million cell updates/sec
                 Mycobacterium tube
Mycobacterium tube
Collagen like port
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
Collagen-like poly
                                                                                                                                                                                                                                                                                                                                                         Description
```

ALIGNMENTS

New DNA and related proteins or RNA derived from M. tuberculosis used for diagnosis of mycobacterial infections, monitoring vaccination and development of anti-mycobacterial agents ξ Claim 11; Fig 16; 55pp; English. N-PSDB; WPI; 1997-549750/50 18-APR-1997; Espitia C, 29-APR-1996; (GBFB) GBF T93610 Honisch C, GES BIOTECH FORSCHUNG 96DE-4017184. 97WO-EP01973 Moreno C, GMBH. singh Z

Intervening se Collagen-like

poly

```
Дb
                                                                                                                                                                                                                                                                                                                                                                       QΥ
                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                        ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                    DЬ
                                                                                                                                                                                                            δõ
                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This novel 55 kDa protein is encoded by an open reading frame of a Mycobacterium tuberulosis DNA fragment (see 793610) containing polymorphic GC-rich sequences. Its amino acid sequence shows high proline content, but there is mo homology to any known proline-rich antigens of mycobacteria. Novel M. tuberculosis proteins (see W31851-57) are claimed. These can be produced as recombinant proteins, especially in bacterial, yeast, fungal or higher eukaryote host cells, and used for diagnosing tuberculosis and other mycobacterial infections in humans or animals. The claimed proteins can also be used for epidemiological studies, for monitoring vaccination, and for the development of vaccines and anti-mycobacterial drugs.
                  Tuberculosis; mycobacteria; infection; diagnosis;
                                            Mycobacterium
                                                                      27-APR-1998
                                                                                                                         W31852 standard; Protein; 763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                             457
                                                                                                                                                                                                                                                                                                                                                397
                                                                                                                                                                                                                                                                                                                                                                          213
                                                                                                                                                                                                                                                                                                                                                                                                   337
                                                                                                                                                                                                                                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               127
                                                                                                                                                                                                                                                                                                                                                                                                                                                     277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         219
                                                                                                                                                                                                                                                                                                                      256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        4
                                                                                                                                                   N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --apdppappltingppspplapvpgaplaplpingrpvfarknslig
                                                                                                                                                                                                                                                        PGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPISGRP----SNSWVGVFTMLSRPSNGA 369
                                                                                                                                                                                                                                                                                                                                                                                                                kpnppappepksspalppappapsmpsavrvppsppippappaaprasmpalppapp 336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    alapplpplaplpispgvppapplppgk--pwttpplapappepktvpvlppgpscppse 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nhppappaapvpgvplaplpnshppappsapvpgvplaplpisgrpvsvwkgsfttlstf 158
                                                                                                                                                                                                                                                                                                          PVPVFPTPPGPPAPPEPNSS--PPAPPAAPLPGPSPPAPPAPPLNSPAAPPGPPAW
                                                                                                                                                                                                                                                                                                                                             elpappdpptppvansppappappsalpfvnppapptpaapksrpalpaappappap
                                                                                                                                                                                                                                                                                                                                                                                                ---PPAPPSPPTSWLAVPVPPVPPVPPLP--VKMPPSPPVPPFPPAEPET------P 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ccrvcsgevlagalnpsrpsrsplttttpalpapipplpplpplpplpintavppipplppvt 218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -DPPMPPA-----IWS-----IWS-----
                                                                                                                                                                                         taaasaaa 572
                                                                                                                                                                                                                AAAASALA 377
                                                                                                                                                                                                                                                                                           pvrattpppappappapnsmalppappdppipll--atppappapplpmsppapplppa-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    233;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  572 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                      (first entry
                                                                                                                                                                                                                                                                                                                                                              ----TPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              48.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; Score 1065.5; D; Pred. No. 5e-52; 31; Mismatches
                                            74 kDa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----ALEAPNPPVPPAPPGP-NSA--PAPPMPP-- 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB 18; Length 572;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               91; Indels 193;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 126
                                                                                                                                                                                                                                                                                                                                                                                                   396
                                                                                                                                                                                                                                                                                                                                                                                                                           212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24;
                                                                                                                                    DЪ
                                                                                                                                                           Qy
                                                                                                                                                                                         В
                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                                                   Qy
                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                      δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          polymorphic GC-rich seques high proline content, proline-rich antigens of proteins (see w31851-57) recombinant proteins, es higher eukaryote host ce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and other mycobacterial claimed proteins can als monitoring vaccination,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This novel 74 kDa protei a Mycobacterium tuberulo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     New DNA and related protused for diagnosis of my vaccination and developm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           anti-mycobacterial drugs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Espitia C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (GBFB ) GBF GES BIOTECH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    29-APR-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18-APR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       06-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mycobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 antimycobacterial; antib
                                                         213
                                                                                                            173
                                                                                                                                      468
                                                                                                                                                                127
                                                                                                                                                                                         410
                                                                                                                                                                                                                                            350
                                                                                                                                                                                                                                                                                              290
                                                                                                                                                                                                                                                                                                                                                235
                                                                                                                                                                                                                  91
                                                                                                                                                                                                                                                                    65
                                                                                                                                                                                                                                                                                                                      55
                                                                                                                                                                                                                                                                                                                                                              4 PVPPAPPAPPSPINPPVPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1997-549750/50
DB; T93610.
                              elpappdpptppvansppa
                                                                                                                                                                                                                                                                                          nhppappaapvpgvplapl
                                                                                                                                                                                                                                                                                                                                               pappappippapv--pipp
                                               -----ANTSNSPLR
                                                                               sppatrlcpplppsppapn
                                                                                                                                                                                      alapplpplaplpispgvp
                                                                                                          NPPA-----PPAPPLEN
                                                                                                                                    kpnppappeppepksspal
                                                                                                                                                              ---PPAPPSPPTSWLAVPV
                                                                                                                                                                                                                                         ccrvcsgevlagalnpsrp
                                                                                                                                                                                                                                                                                                                     -DPPMPPA-----
                                                                                                                                                                                                                                                                                                                                                                                                   tch 48. al Similarity 42. 233; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5; Fig 13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   763 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Honisch C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tuberculos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96DE-4017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              97WO-EP01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             55pp; E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    there is anno acid sequence shows there is no homology to any known robacteria. Novel M. tuberculosis to claimed. These can be produced as itally in bacterial, yeast, fungal or and used for diagnosing tuberculosis fections in humans or animals. The pused for epidemiological studies, for it for the development of vaccines and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 :1c;
                                                                                                                                                                                                                                                                                           hppappsapvpgvplaplpisgrpvsvwkgsfttlstf 349
                                             IPPAPPLK----PGPPAPPMPPAPNS----PAAPPSPPSP
                                                                                                                                                                                     pippgk--pwttpplapappepktvpvlppgpscppse 467
                                                                                                                                                                                                                                         pltttpalpapipplpplpplpintavppipplppvt
                                                                                                                                                                                                                                                                                                                                                             PLPAAPRTLSPEVEPAPPSPISLAA-----PPLPP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    is encoded by an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              lish.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     is or RNA derived from M. tuberculosis sacterial infections, monitoring of anti-mycobacterial agents
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  eno
                                                                                pappapptppkllsanppcppvppapnrppappappapp
                                                                                                          --- AddAddd
                                                                                                                                    1ppapsmpsavrvppsppippappaaprasmpalppapp
                                                                                                                                                                PPVPPLP--VKMPPSPPVPPFPPAEPET-----P
                                                                                                                                                                                                                  PVPPGSGAPRPVPAVPPMPPAPKRMPALPPA-----
                                                                                                                                                                                                                                                                                                                                               Slppvpnki-ppappap--pvavaavlvapcpplpplpn 289
                              ıppappsalpfvnppapptpaapksrpalpaappappap
                                                                                                                                                                                                                                                                    -----ALEAPNPPVPPAPPGP-NSA--PAPPMPP--
                                                                                                                                                                                                                                                                                                                                                                                                 Score 1065.5;
Pred. No. 6.20
31; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SCHUNG GMBH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                vaccine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     coded by an open reading frame of fragment (see T93610) containing
                                                                                                                                                                                                                                                                                                                      Singh
                                                                                                                                                                                                                                                                                                                                                                                                               2e-52
                                                                                                   ---AGAGGAAGANTLTAGAAG----
                                                                                                                                                                                                                                                                                                                                                                                                                           DB 18; Length 763;
                                                                                                                                                                                                                                                                                                                                                                                                    Indels 193;
```

Gaps

24;

54

64

527

647

```
THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WAY AND THE WA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ωy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          04-NOV-1986;
29-OCT-1987;
09-NOV-1988;
07-NOV-1989;
                                                                                                                          other than the repeating unit.
The polymer can be used to make fibres, films, membranes,
menulsions, coatings, etc., useful as, e.g. specific binding
materials, catalysts, purificn. agents, composites, laminates,
adhesives, cell growth surfaces, affinity columns and supports i
biological materials. Typical applications include wound
dressings, and in vivo protheses. The polymer produces articles
                                                                                                                                                                                                                                                                                                        Novel DNA sequence encodes a polymer comprising segments of repeating units of 3-9 amino acids from natural collagen, i.e. the present sequence collagen like protein (CLP), able to assemble into aligned structures formable into articles. The polymer comprises at least 2 segments joined by an unaligned intervening oligopeptide,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Polymer; repeat unit; natural collagen; intervening oligopeptide; fibre; film; membrane; emulsion; coating; collagen like protein; specific binding material; catalyst; purification agent; composit; laminate; adhesive; cell growth surface; affinity column;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cappello J,
                                                                         with good mechanical properties, and the intervening oligopeptide can provide a ligand for binding a mol., antibody, etc., or a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               wound
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    06-NOV-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        04-NOV-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              07-MAY-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US5514581-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    biological material support;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Collagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   03-FEB-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        W07539
  Sequence
                                                      can provide a chemically rea
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Example
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNA encoding protein contg.
linked by oligopeptide with
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (PROT-) PROTEIN POLYMER TECHNOLOGIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       W07539;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               705
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 648
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1996-238772/24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --apdppappltingppspplapvpgaplaplpingrpvfarknslig---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPISGRP----SNSWVGVFTWLSRPSNGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               taaasaaa 763
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAAASALA 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              pvrattpppappappapnsmalppappdppipll--atppappapplpmsppapplppa-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               dressings
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ω
,,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            like protein (CLP)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Columns 99-102;
                                                      reactive
     408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 membrane; emulsion; coating; collagen like protein; ding material; catalyst; purification agent; composite; hesive; cell growth surface; affinity column; aterial support; wound dressing; in vivo prothesis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       86US-0927258.
87US-0114618.
88US-0269429.
89WO-US05016.
  A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    90US-0609716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        86US-0927258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      71pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     repeated fibroin derived segments cell adhesion properties useful, (
                                                   coupling
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INC
                                                      ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --sssgd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     e.g.
                                                                                                                                                                                      for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               755
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    704
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вр
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                20
W57645
                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                               ID
                                                                                                                                                                                                                                                                                                                                                                                    RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                02-MAY-1996;
04-NOV-1986;
29-CCT-1987;
09-NOV-1988;
06-NOV-1990;
12-NOV-1991;
05-NOV-1992;
22-DEC-1995;
                                                                                                                                                                                                                                                                      Collagen-like polymer; synthetic polymer; fibre coating; prosthetic device; catalytic substance.
                                                        Cappello
                                                                                                                                                                                                                               US5773249-A
                                                                                                                                                                                                                                                  Synthetic.
                                                                                                                                                                                                                                                                                                    Collagen-like
                                                                                                                                                                                                                                                                                                                                            W57645;
                                                                                                                                                                                                                                                                                                                                                                W57645
                                     WPI; 1998-387004/33
                                                                                                                                                                                         02-MAY-1996;
                                                                                                                                                                                                            30-JUN-1998
                                                                                                                                                                                                                                                                                                                         27-AUG-1998
         fibres,
                 Recombinant
                                                                            (PROT-) PROTEIN POLYMER TECHNOLOGIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         213
                                                                                                                                                                                                                                                                                                                                                                                                                    385
                                                                                                                                                                                                                                                                                                                                                                                                                                       349
                                                                                                                                                                                                                                                                                                                                                                                                                                                           327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4
                                                                                                                                                                                                                                                                                                                                                                                    4
                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                       G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PLKPGPPAPPMPPAPNSPAAPPSPPSPPVPVFPTPPGPPAPPEPNSSPPAPPAPPAAPLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PVPPAPPAPPSPINPPVPPVPPLPA----APRILSPPVPPAPPSPISLAAPPLPPDPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                         -pgppgppgpagpvgspqapgpgpgpgpgpgpgpgpgpgpgpgpgpgpgppgpagpvgsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPSPPAPPAPPLPNSPAAPPGPPAWPGAPDPPAPPLPYSSPPAPPACPVPGAPLAPLPIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pgppgppgapgppgppgppgpagpv--gspgapgpp-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pgppgppgpagpvgspgapgppgppgppgppgppgppgppgppgppgppgpagpvgspgapgp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PAPPAPPLENSP-----PPPPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PAPKRMPALPPAPPAPPSPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PAIWSAL - - - EAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGS - GAP - RPVPAVPPMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pgppgapg-ppgppgppp-----gpagpvgspgapgppgppgppgppgapgpppp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pgpagpvgspgapgppgppgppgapgppgppgppgppgpagpvgspgapgppgppgp
                                                                                                                                                                                                                                                                                                                                                                standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                       349
                                                                                                                                                                                                                                                                                                                                                                                                                    385
         etc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                         ٦
                 collagen-like polymers -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                         Ferrari
                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                     polymer
                                                                                               86US-0927258.

87US-0114618.

88US-0269429.

90US-0609716.

91US-0791960.

92US-0972032.

95US-0577046.
                                                                                                                                                                     96US-0642255
                                                                                                                                                                                         96US-0642255
                                                                                                                                                                                                                                                                                                                                                              peptide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                37.5%;
46.8%;
                                                                                                                                                                                                                                                                                                                                                                330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 832; DB 17;
Pred. No. 2.5e-39;
                                                                                                                                                                                                                                                                                                                                                                AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches 155;
                                                                              INC
                  useful
                 for making
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -gppgppgppgapgp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 <del>...</del>
                 gels, films
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      32;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  59
                                                                                                                                                                                                                                                                                                                                                                                                                                                           384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           228
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11;
```

```
QΥ
В
                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Sim
Matches 150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This sequence represents a unnatural collagen-like polymer of the invention. The products may be used as films, fibres, moulded objects and admixed with other natural or synthetic polymers or coatings on fibres, films, labware or other surfaces, e.g. prosthetic devices. The polymers may be used for binding a wide variety of sequence may specifically chelate a wide variety of elements), as purification media, composites, laminates or adhesives. They may also be combined with inorganic or organic materials such as carbon fibres, nylon fibres, nitrocellulose, etc., as flask coatings or in synthetic matrices for the growth and study of cells, as affinity columns or as supports for be lological materials. The polymers have collagen-like properties, but may be easily expressed in micro-organisms in high efficiency. The new sequences can be tailored to give the desired properties.
                WO9310154-A.
                                                             Protein
                                                                                                                                                                     Recombinant; collagen-like polymer; CLP; tripeptide; helix; membrane; fibre; film; coating; triad sequence; collagen; mammalian; moulding; hydrogel; interchain linkage; colloid suspension; DCP; antibody.
                                                                                                                                                                                                                                                                 07-SEP-1993
                                                                                                                                                                                                                                                                                                                              R37739 standard;
                                                                                                                                        Synthetic
                                                                                                                                                                                                                                    Collagen-like
                                                                                           Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Example 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     224
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      69
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     26
                                                                                                                                                                                                                                                                                                                                                               Ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETPNPPAPPAPPLENSPPP 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPRPVPAVPPMPPAPKRMPALPPAPP 128
                                                                                                                                                                                                                                                                                                                                                                                                                              PNSPAAPPGPPAWPGAPDPPAPPLPYSSPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      P-----PSPPSPPVPVFPTPPGPPAPPEPNSSPPAPPAP--PAAPLPGPSPPAPPAPPL 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PPVPPVPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPAPPLKPGPPAPPMPPAPNSPAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ppfasdpmgapgppgpp-----gppgppgapgp---pgppgppgppgpagpvgspga 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PPAPPSPINPPVPPVPPLPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAIWSALEA 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pvgspgapgppgpg---pgppgapgpp----gppgppgppgpagpvgspgapgppgppg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               pagpgdpgdpgdpgdpgdpgdpg-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gppgpp----gapgppgppgpp----gppgpagpvgspgapgppgppgppgppgapgppg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pgppgppgppgapgppgppgppgppgpag----pvgs----pgapg-----ppgpp 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              330 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Column
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                  polymer DCP1 encoded by clone pPT 0166.
                                             Location/Qualifiers
34..285
/label= DCP1
286..537
/label= DCP1
                                                                                                                                                                                                                                                                                                                              Protein; 561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             32.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        93pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 721; DB
Pred. No. 2.6e-
5; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 19;
2.6e-33;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 330;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12;
```

Qy

452

pagppg-apgpa

462

Qy Ъ Qy Ър ρ B Q Ъ QΥ DЪ

```
Query Match 27.
Best Local Similarity 35.
Matches 154; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This sequence is an examilike polymer (CLP) which selected from a wide rar amino acid. The DNA encept 0166 and used to traunits of; A = APCPABPP, polymers may be used to polymers have molecular due to interchain linkag of tripeptide triad sequent mammalian collagens. The materials such as fibres colloid suspensions and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Cappello
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-NOV-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        04-NOV-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           27-MAY-1993
  372
                                    410
                                                                                                                350
                                                                                                                                                                                        290
                                                                                                                                                                                                                             207
                                                                                                                                                                                                                                                                  230
                                                                                                                                                                                                                                                                                                         168
                                                                                                                                                                                                                                                                                                                                           174
                                                                                                                                                                                                                                                                                                                                                                                118
                                                                                                                                                                                                                                                                                                                                                                                                                   114
                                                                                                                                                                                                                                                                                                                                                                                                                                                      63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4
                                                                                                              apgpagppgapgpagppga
                                                                                                                                                                                                                                                                                                                                                                                                                 pgapgpagppgapgpagpp
                                                                                                                                                                                                                                                                                                                                                                                                                                                      WSALEAPNPPVPPAPPGPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pgpagppgapgpagppgap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVPPAPPAPPSPINPPVPF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mol.
AASALAYAPAPA
                                                                         WPGAPDPPAPPLPYSSPPA
                                                                                                                                                   FPTPPGPPAPPEPNSSP--
                                                                                                                                                                                                                                                             ppgapgpagppgapgpagp
                                                                                                                                                                                                                                                                                                                                       agppgapgpagppgapgpa
                                                                                                                                                                                                                                                                                                                                                                            KRM-----PALPPAPPAPF
                                                                                                                                                                                        pagpkgahgpagpkgapgp
                                                                                                                                                                                                                           PPAPPAANTSNSPLRPPAP
                                                                                                                                                                                                                                                                                                    EPETPNPPAPPAPPLENSP
                                    ppgapgpagpp-gapgpag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PROTEIN POLYMER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   in u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 t. collagen-l
unicellular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      91US-0791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        92WO-US09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              40; 82<sub>F</sub>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           h b of a recombinantly produced DCP collagen-
h, bnsist of repeated tripeptide sequences
of GXV sequences, where X and Y can be any
ing this sequence was cloned into plasmid
form E. coll. DCP peptides comprise repeated
form E. coll. DCP peptides comprise.
GSRGDDGCP antibodies in rabbits. These
ise anti-DCP antibodies in rabbits. These
jets anti-DCP antibodies in rabbits. These
jets of 530 kD and are able to form helices
These polymers pref. contain a proportion
pes found in natural collagens, pref.
LIPS impart unique characteristics to
bembranes, films, coatings, hydrogels,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  P-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAJ 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 p protein polymers - capable of being
proorganisms
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHNOLOGIES INC
                                                                         CPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAA
                                                                                                                                                                                                                           PLKPGPPAPPMPPAPNSPAAPPSPPSPP-----VPV
                                                                                                                                                                                                                                                                apgpagppgapgpagppgahgpagpkgahgpagpkgahg
                                                                                                                                                                                                                                                                                                       ---- GANTLIAGAGAGAGAG
                                                                                                                                                                                                                                                                                                                                                                                                                 gpagppgapgpagppgapgpagppgapppgapgp
                                                                                                                                                                                                                                                                                                                                                                                                                                                      PAPPMPPTPPLPPVPPGSGAP-----RPVPAVPPMPPAP 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      agppgapgpagppgapgpagppgapppgapgpagp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ulded articles.
                                                                                                              PAPPAAPLP----GPSPPAPPAPPLPNSPAAPPGPPA
                                                                                                                                                                                                                                                                                                                                                                            TSWLAVPVPPVPPVPPLP----VKMPPSPPVPPFPPA 167
                                                                                                                                                                                      pgapgpagppgapgpagppgapgpagppgapgpagppg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            English.
                                                                                                                                                                                                                                                                                                                                       ---gapgpagppgapgpagppgapgpagppgapgpag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 598.5; DB 14;
Pred. No. 2e-26;
3; Mismatches 200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                       V-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                        349
                                                                                                                                                                                                                                                                  289
                                                                                                                                                                                                                                                                                                                                         229
                                                                                                                                                                                                                                                                                                                                                                                                                 173
                                                                                                                                                                                                                             259
                                                                                                                                                                                                                                                                                                       206
```

14;

r;

```
δÃ
                                                                                                                                                                                                                                                        Qγ
                                             Qy
                                                                                                        g
                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 05-NOV-1992;
06-NOV-1990;
12-NOV-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    affect properties such as helix stability, hydration, solubility, gel point, biodegradation and immunogenicity. Triads of particular interest include GAP, GPA, GPP, GAS, GPG, GPS, GAQ, GSP, GIQ, GPR, GPK, GAK, GAR, GER, GDR, GEP, GDA, GAH and GEA. The collagen-like polymers may impart new characteristics, finding wide used in photographic, medical, structural and fibre applications, and are capable of being produced in unicellular microorganisms at high mol. wts. and in high efficiency. The present sequence, encoded by pPT0166, is a SequenceD gene 1 polymer. The SequenceD collagen-like polymers are used as immunogens for the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The invention concerns collagen-like polymers having repetitive triads with reduced proline content, and where glycine is the initial amino acid and the subsequent amino acids are varied. The choice of triads utilised in a recombinant collagen-like polymer collection of the choice of triads to the choice of triads are varied to the choice of triads to the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice of the choice o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Collagen-like polymers comprising repetitive triads unicellular organisms with improved characteristics, u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Example
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        photographic and medical fibres
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cappello
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 1996-150728/15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (PROT-) PROTEIN POLYMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         06-NOV-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               05-MAR-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US5496712-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  photographic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             collagen;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Collagen-like polymer sequence D gene 1 polymer protein (pPT0166)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-FEB-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R93249;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R93249 standard;
        230
                                                          168
                                                                                                           174
                                                                                                                                                                                                              114
                                                                                                                                                                                                                                                              63
                                                                                                                                                                                                                                                                                                                 54
                                                                                                                                                                                                                                                                                                                                                              4 PVPPAPPAPPSPINPPVPPVPP-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI
                                                     EPETPNPPAPPAPPLENSPPPPPVPPVPPVPPLTLNPP-
                                                                                                                                                                                                      pgapgpagppgapppgapppagppgapppagppgapppagppgapppagpppagpppappp
                                                                                                                                                                                                                                                              WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAP---
                                                                                                                                                                                                                                                                                                         pgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagp
ppgapgpagppgapppgapppagppgapppgahgpagpkgahgpagpkgahg
                                                                                                     agppgapgpagppgapgpagpp
                                                                                                                                                        KRM-----PALPPAPPAPPSPPTSWLAVPVPPVPPVPPLP-----VKMPPSPPVPPFPPA
                                                                                                                                                                                                                                                                                                                                                                                                                         154;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          repetitive triad motif; recombinant production
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    antibodies.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Column 18; 43pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    561
                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 92US-0972032.
90US-0609716.
91US-0791960.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  medical; structural; fibre
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    $
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         90us-0609716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                            27.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        English.
                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 598.5; DB Pred. No. 2e-26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ą
                                                                                                     -gapgpagppgapgpagppgapgpagppagpag
                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 17;
                                                                                                                                                                                                                                                                                                                                                                                                                    200;
                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                              --RPVPAVPPMPPAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length

    produced
useful in,

                                                                                                                                                                                                                                                                                                                                                                                                                    75;
                                                        ۲-۲
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                e.
                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                     206
                                                                                                     229
                                                                                                                                                        167
                                                                                                                                                                                                           173
                                                                                                                                                                                                                                                                                                              113
                                                                                                                                                                                                                                                                                                                                                                                                                    14;
```

```
RESULT
W57650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δÔ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                      on fibres, films, labware or other surfaces, e.g. prosthetic devices. The polymers may be used for binding a wide variety of specific binding materials, as catalytic substances (where the amino acid sequence may specifically chelate a wide variety of elements), as purification media, composites, laminates or adhesives. They may also be combined with inorganic or organic materials such as carbon fibres, nylon fibres, nitrocellulose, etc., as flask coatings or in synthetic matrices for the growth and study of cells, as affinity columns or as supports for biological materials. The polymers have collagen-like properties, but may be easily expressed in micro-organisms in high efficiency. The new
                                                                                                                                                                                                                                                                                                                                                                  02-MAY-1996;
04-NOV-1986;
29-OCT-1987;
09-NOV-1988;
06-NOV-1990;
12-NOV-1991;
05-NOV-1991;
22-DEC-1995;
                                                                                                                                               This sequence represents a unnatural collagen-like polymer of the invention. The products may be used as films, fibres, objects and admixed with other natural or synthetic polymers on fibres, films, labware or other surfaces, e.g. prosthetic
                                                                                                                                                                                                                                                                                      WPI; 1998-387004/33
                                                                                                                                                                                                                                                                                                              Cappello
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      30-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US5773249-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Collagen-like
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Collagen-like
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             W57650
                                                                                                                                                                                                                  Example 3; Column 28; 93pp; English.
                                                                                                                                                                                                                                                         Recombinant collagen-like polymers -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           02-MAY-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    prosthetic device; catalytic substance
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       27-AUG-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  W57650;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             452 pagppg-apgpa 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPGAPDPPAPPLPYSSPPAPPACPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       apgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AASALAYAPAPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ppgapgpagpp-gapgpagppgapgp-agpp---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPP-----VPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FPTPPGPPAPPEPNSSP--PAPPAPPAAPLP----GPSPPAPPAPPLPNSPAAPPGPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pagpkgahgpagpkgapgpagppgapgppgapgppgapgpagppgapppagppgagppg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            standard;
                                                                                                                                                                                                                                                                                                                                          PROTEIN
                                                                                                                                                                                                                                                                                                               J,
            can be
                                                                                                                                                                                                                                                                                                              Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 polymer; synthetic polymer;
                                                                                                                                                                                                                                                                                                                                                                                                          96US-0642255.
86US-0927258.
87US-0114618.
88US-0269429.
90US-0609716.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            polymer
                                                                                                                                                                                                                                                                                                                                                                    95US-0577046
                                                                                                                                                                                                                                                                                                                                                                                 91US-0791960
92US-0972032
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           96US-0642255
                                                                                                                                                                                                                                                                                                                                          POLYMER
            tailored
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          peptide;
                                                                                                                                                                                                                                                                                                                 FΑ
                                                                                                                                                                                                                                                                                                                                          TECHNOLOGIES
            ťo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             561 AA
           give
            the
                                                                                                                                                                                                                                                           useful
           desired
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  fibre
                                                                                                                                                                                                                                                         for making
           properties
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 coating;
                                                                                                                                                                                                                                                         gels,
                                                                                                                                             or coatings
devices. Th
                                                                                                                                                                          moulded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gapg.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          259
                                                                                                                                               The
```

```
RESULT
R37740
ID R3
XX
AC R3
XX
DT 07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
Вþ
                                                                                                                                                                                                                                                                                                                                                                           Ωy
                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                   Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     БР
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ŝ
           04-NOV-1992;
                                                                                                                                                           Key
Protein
                                                                                                                                                                                                         Recombinant; collagen-like polymer; CLP; tripeptide; helix; membrane; fibre; film; coating; triad sequence; collagen; mammalian; moulding; hydrogel; interchain linkage; colloid suspension; DCP; antibody.
                                                WO9310154-A.
                                                                              Protein
                                                                                                                                                                                        Synthetic
                                                                                                                                                                                                                                                 Collagen-like polymer DCP2 encoded by clone pPT 0159.
                                                                                                                                                                                                                                                                     07-SEP-1993
                                                                                                                                                                                                                                                                                                            R37740 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                               27-MAY-1993
                                                                                                  Protein
                                                                                                                      Protein
                                                                                                                                        Protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               174
                                                                                                                                                                                                                                                                                                                                                                                 372
                                                                                                                                                                                                                                                                                                                                                                                                     410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   118
                                                                                                                                                                                                                                                                                                                                                               452
                                                                                                                                                                                                                                                                                                                                                                                                                        313
                                                                                                                                                                                                                                                                                                                                                                                                                                           350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       114
                                                                                                                                                                                                                                                                                                                                                                                                                                                               260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            54
                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                AASALAYAPAPA 383
                                                                                                                                                                                                                                                                                                                                                                                                               WPGAPDPPAPPLPYSSPPAPPACPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAA 371
                                                                                                                                                                                                                                                                                                                                                                                                                                                     FPTPPGPPAPPEENSSP--PAPPAPPAAPLP-----GPSPPAPPAPLENSPAAPPGPPA 312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pgapgpagppgapgpagppgapgppgapgpagppgapgpagppgapgpagppgapgp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              agppgapgpagppgapgpagpp----gapgpagppgapgpagppgapgpagppgapgpag 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KRM-----PALPPAPPAPPSPPTSWLAVPVPPVPPVPPLP----VKMPPSPPVPPFPPA 167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAP-----RPVPAVPPMPPAP 117
                                                                                                                                                                                                                                                                                                                                                                                                                                         apgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               pagpkgahgpagpkgapgpagppgapgppgapgppagppgapgpagppgapgpagppg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPP------VPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ppgapgpagppgapgpagppgapgpagppgapgpagppgahgpagpkgahgpagpkgahg 289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EPETPNPPAPPAPPLENSPPPPPPPPPPPPPLTLNPP------V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          pgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagp 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PVPPAPPAPPSPINPPVPPVPP-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                                                                                                                                                            pagppg-apgpa
                                                                                                                                                                                                                                                                                                                                                                                                   ppgapgpagpp-gapgpagppgapgppappp-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                    (first entry)
           92WO-US09485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                    466..609
/label DCP2
610..753
/label DCP2
                                                                                                                                                            Location/Qualifiers 34..177
                                                                                                  /label=
466..60
                                                                                                                     /label= [
322..465
                                                                                                                                      /label= DCP2
|78..321
                                                                                                                                                                                                                                                                                                             Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           27.0%;
35.6%;
                                                                                                                              DCP2
                                                                                                          DCP2
                                                                                                                                                                                                                                                                                                              777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 598.5; DI
Pred. No. 2e-26
3; Mismatches
                                                                                                                                                                                                                                                                                                             AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 561;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   75;
                                                                                                                                                                                                                                                                                                                                                                                                  -gapg 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   14;
                                                                                                                      밁
                                                                                                                                    Qy
                                                                                                                                                           g
                                                                                                                                                                           Qy
                                                                                                                                                                                                 B
                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                       DЬ
                                                                                                                                                                                                                                                        QΥ
                                                                                                                                                                                                                                                                              DЬ
                                                                                                                                                                                                                                                                                               δÃ
                                                                                                                                                                                                                                                                                                                     DЬ
                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 145; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    selected from a wide rar amino acid. The DNA encept 0.159 and used to traunits of; A = GAPCPAGPP, polymers may be used to polymers have molecular due to interchain linka; of tripeptide triad sequenammalian collagens. The materials such as fibres colloid suspensions and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  High mol. produced i
           R93250
                            R93250 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Cappello J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12-NOV-1991;
                                                                                                                                                                                                                                                           173
                                                                              465
                                                                                                 375
                                                                                                                      413
                                                                                                                                        316
                                                                                                                                                            353
                                                                                                                                                                             263
                                                                                                                                                                                                 295
                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                        235
                                                                                                                                                                                                                                                                               183
                                                                                                                                                                                                                                                                                                                      123
                                                                                                                                                                                                                                                                                                                                          63
                                                                                                                                                                                                                                                                                                                                                            63
                                                9
                                                                             kgahgpa
                                                                                                ALAYAPA 381
                                                                                                                                                                                                              GPPAPPMPPAPNSPAAP--
                                                                                                                                                                                                                                      gpagppgapgpagppgapg
                                                                                                                                                                                                                                                     NPPAPPAPPLENSPPPPPV
                                                                                                                                                                                                                                                                              agpkgahgpagpkgapgpa
                                                                                                                                                                                                                                                                                                 MPPAPKRMPALPPAPPAPF
                                                                                                                                                                                                                                                                                                                     pgapgpagppgapgpagpp
                                                                                                                                                                                                                                                                                                                                         WSALEAPNPPVPPAPPGPI
                                                                                                                                                                                                                                                                                                                                                                               PVPPAPAPAPAPINPPVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      polymer (CLP) who ted from a wide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sequence is an exam
                                                                                                                                                                             PPGPPAPPEPNSSP--PAF
                                                                                                                                                                                                gapgpagppgahgpagpkg
                                                                                                                                                                                                                                                                                                                                                            pgpagppgapgpagppgap
                                                                                                                   apgpagpp-gapgpagppg
                                                                                                                                                          pagppgapgpagppgapgp
                                                                                                                                      APDPPAPPLPYSSPPAPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . wt. collagen-! in unicellular
                                                                                                                                                                                                                                                                                                                                                                                                                                                      777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Page 42;
                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                              471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          91US-079:
                              Protein
                               177
```

```
on ist of recombinantly produced DCP2 collagen-
onsist of repeated tripeptide sequences
of GXY sequences, where X and Y can be any
in form E. coli. DCP peptides comprise repeated
- GSRCIDEGP and/or C = GARGPAGPK. These
ise anti-DCP antibodies in rabbits. These
ights of >30 kD and are able to form helices
if these polymers pref. contain a proportion
ces found in natural collagens, pref.
CLPPs impart unique characteristics to
membranes, films, coatings, hydrogels,
ulded articles.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         e protein polymers - capable of being croorganisms
                                  VP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAAS
                                                                                                                                                                            jpagpkgahgpagpkgahgpagppga--pg 352
                                                                                                                                                                                                                                                                                                                             VPPVPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKP:232
                                                                                                                                                                                                                                                                                                                                                                                      p----gapgpagppgap----gpagppgapgpagppgap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PAPPMPPTPPLPPVPPGSGAPR------PVPAVPP, 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hgppgapgpagppgapgpagppgapgpagppgapg 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P-LPAAPRTLSPPVPPAAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHNOLOGIES
jpagppgapgpagppgahgpag-----pkgahgpagp 464
                                                                                                                                             PPAAPLP-----GPSPPAPPAPPLPNSPAAPPGPPAWPG
                                                                                                                                                                                                                                                                                        jppgapgpagppgapgpagppgapgpagpp
                                                                                                                                                                                                                                                                                                                                                                                                                                      PTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETP 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pgpagppgapgpagppgahgpagpkgahgpagpkgahgp 182
                                                                                          pgapgpagppgapgpagppgapgpagppgapgpagppg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 570.5; DB 14;
Pred. No. 8.5e-25;
6; Mismatches 209;
                                                                                                                                                                                                                                              -----PSPPSPPVPVFPT 262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                              294
                                                                                                                                                                                                                                                                                                                                                                                           234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11;
```

AA

```
δÃ
                                                                                                                                                                                                                                QΨ
                                                                                                                                                                                                                                                                                                                                                                                                                     Š
                                                                 뮍
                                                                                              Qy
                                                                                                                                  밁
                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                Db
                                                                                                                                                                                                                                                                                               Q
   멍
                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                      The invention concerns collagen-like polymers having repetitive triads with reduced proline content, and where glycine is the initial amino acid and the subsequent amino acids are varied. The choice of triads utilised in a recombinant collagen-like polymer are chosen in order to affect properties such as helix stability, hydration, solubility, gel point, blodegradation and immunogenicity. Triads of particular interest include GAP, GPP, GPP, GAS, GPC, GPS, GAQ, GSP, GIQ, GPR, GPK, GAR, GRER, GDR, GEP, GDA, GAH and GEA. The collagen-like polymers may impart new characteristics, finding wide used in photographic, medical, structural and fibre applications, and are capable of being produced in unicellular microorganisms at high mol. wts. and in high efficiency. The present sequence, encoded by pPT0159, is a SequenceD gene 2 polymer. The SequenceD collagen-like polymers are used as immunogens for the present of antibndies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                05-NOV-1992;
06-NOV-1990;
12-NOV-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Collagen-like polymers comprising repetitive triads - produced unicellular organisms with improved characteristics, useful in,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                collagen; repetitive triad motif; recombinant photographic; medical; structural; fibre.
                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 photographic and medical fibres
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 1996-150728/15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cappello J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (PROT-) PROTEIN POLYMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 06-NOV-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  05-MAR-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US5496712-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Collagen-like polymer sequence D gene 2 polymer protein (pPT0159).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  24-FEB-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                  prepn. of antibodies.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Example 2; Column 19; 43pp; English.
                                                                                                                                   183
                                                                                                                                                                                                   123
                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                  63
                                                                                                                                                                                                                                                                                                 4 PVPPAPPAPPSPINPPVPPVPP-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI
GPPAPPMPPAPNSPAAP----
                                                               gpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagpp
                                                                                                                                agpkgahgpagpkgapgpagpp----gapgpagppgap----gpagppgapgpagppgap
                                                                                                                                                                MPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETP
                                                                                                                                                                                                                                 WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPR-----PVPAVPP
                                                                                                   NPPAPPAPPLENSPPPPPVPPVPPPLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKP
                                                                                                                                                                                                 pgapgpagppgapgpagppagppgapgpagppgahgpagpkgahgpagpkgahgp
                                                                                                                                                                                                                                                             pgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagp 122
                                                                                                                                                                                                                                                                                                                                   145;
                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                   777 AA;
                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                92US-0972032.
90US-0609716.
91US-0791960.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90US-0609716
                                                                                                                                                                                                                                                                                                                                                 25.7%;
34.0%;
                                                                                                                                                                                                                                                                                                                                   6
                                                                                                                                                                                                                                                                                                                                Score 570.5; DB 17;
Pred. No. 8.5e-25;
6; Mismatches 209;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  characteristics, useful in,
                                                                                                                                                                                                                                                                                                                                                                DB 17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 production;
                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                Length
                                  -PSPPSPPVPVFPT
                                                                                                                                                                                                                                                                                                                                 67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              e.g.
                                  262
                                                                                                                                                                    172
                                                                                                                                                                                                 182
                                                                                                                                                                                                                                                                                                   62
                                                                 294
                                                                                                                                                                                                                                                                                                                                   11;
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Qγ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Вþ
                                                                                                                                                                                                                                                                                                                                                                  02-MAY-1996;
04-NOV-1986;
29-OCT-1987;
09-NOV-1988;
06-NOV-1990;
12-NOV-1991;
05-NOV-1992;
22-DEC-1995;
                                                            of the invention. The products may be used as films, fibres, moulded objects and admixed with other natural or synthetic polymers or coatings on fibres, films, labware or other surfaces, e.g. prosthetic devices. The polymers may be used for binding a wide variety of specific binding materials, as catalytic substances (where the amino acid sequence may specifically chelate a wide variety of elements), as purification media, composites, laminates or adhesives. They may also be combined with inorganic or organic materials such as carbon fibres, mylon fibres, nitrocellulose, etc., as flask coatings or in synthetic matrices for the growth and study of cells, as affinity columns or as supports for the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Collagen-like
prosthetic dev
                                       be easily
                                                                                                                                                                                              This sequence represents a unnatural collagen-like polymer
                                                                                                                                                                                                                                                                                         WPI; 1998-387004/33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       02-MAY-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US5773249-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Collagen-like
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         27-AUG-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     W57651;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W57651 standard; peptide; 777
                                                    biological materials.
                                                                                                                                                                                                                                                                Recombinant
                                                                                                                                                                                                                                                                                                                                          (PROT-) PROTEIN POLYMER TECHNOLOGIES
                                                                                                                                                                                                                          Example
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    375 ALAYAPA 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          kgahgpa 471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            apgpagpp-gapgpagppgapgpagppgapgpagppgahgpag-----pkgahgpagp 464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APDPPAPPLPYSSPPAPPACPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               pagppgapgpagppgapgpagppgapgpagppgapgpagppgapgppgapgpagpp
                                                                                                                                                                                                                                                   etc
                                                                                                                                                                                                                          ω
--
                                     l materials. The polymers have collagen-like properties, but expressed in micro-organisms in high efficiency. The new
                           can be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        device;
                                                                                                                                                                                                                          Column 29;
                                                                                                                                                                                                                                                              collagen-like polymers -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          polymer; synthetic polymer;
vice; catalytic substance.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                polymer
                                                                                                                                                                                                                                                                                                                                                                    900S-0609716.
910S-0791960.
920S-0972032.
950S-0577046.
                                                                                                                                                                                                                                                                                                                                                                                                                     96US-0642255.
86US-0927258.
87US-0114618.
88US-0269429.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      96US-0642255
                           tailored
                                                                                                                                                                                                                        93pp; English.
                         to give
                                                                                                                                                                                                                                                                useful
                         desired
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       fibre coating;
                                                                                                                                                                                                                                                                for
                         properties
                                                                                                                                                                                                                                                              making
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 412
```

Sequence

777 AA;

:-

in

```
RESULT 11
R95115
ID R95115
XX
AC R95115
XX
DT 03-FEB
XX
DT 03-FEB
XX
DE Interv
XX
Polyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                 06-NOV-1990;
04-NOV-1986;
29-OCT-1987;
09-NOV-1988;
07-NOV-1989;
                                                                                                                                                                                                                                                                                                                                                                                                  Polymer; repeat unit; natural collagen; intervening oligopeptide; fibre; film; membrane; emulsion; coating; collagen like protein; specific binding material; catalyst; purification agent; composite; laminate; adhesive; cell growth surface; affinity column; biological material support; wound dressing; in vivo prothesis.
                   WPI; 1996-238772/24
                                                      Cappello
                                                                                                                                                                                                                                                 04-NOV-1986;
                                                                                                                                                                                                                                                                                       07-MAY-1996.
                                                                                                                                                                                                                                                                                                                            US5514581-A
                                                                                                                                                                                                                                                                                                                                                               Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Intervening sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R95115 standard;
                                                                                              (PROT-) PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        03-FEB-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R95115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            465
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALAYAPA 381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          kgahgpa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPGPPAPPEPNSSP--PAPPAAPPAAPLP-----GPSPPAPPAPPLPNSPAAPPGGPPAWPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPAPPMPPAPNSPAAP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          apgpagpp-gapgpagppgapgpagppgapgpagppgahgpag-----pkgahgpagp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APDPPAPPLPYSSPPAPPACPVP-GAPLAPLPISGRPSNSWVGVFTMLSRPSNGAAAAAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           pagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagppg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  {\tt gapgpagppgahgpagpkgahgpagpkgahgpagpkgahgpagppga--pg}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gpagppgapgpagppgapgpagppgapgpagppgapgpagppgapgpagpppagppp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NPPAPPAPPLENSPPPPPPPPPPPPPPLTLNPPPPPPPPAPPANTSNSPLRPPAPPAPPLKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       agpkgahgpagpkgapgpagpp----gapgpagppgap----gpagppgapgpagppgap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKMPPSPPVPPFPPAEPETP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pgapgpagppgapgpagppgapgpagppgapgpagppgahgpagpkgahgpagpkgahgp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pgpagppgapgpagppgapgpagppgapgpagppgapgppgapgpagppgapgpagp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PVPPAPPAPPSPINPPVPPVPP-LPAAPRTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         145;
                                                      J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                         Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                 90US-0609716.
86US-0927258.
87US-0114618.
88US-0269429.
89WO-US05016.
                                                                                                                                                                                                                                                 86US-0927258
                                                                                              POLYMER TECHNOLOGIES INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25.7%;
                                                           FA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                contg. collagen like protein (CLP)-CB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 570.5; DB 19; Lengtl
Pred. No. 8.5e-25;
6; Mismatches 209; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PSPPSPPVPVFPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11;
                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DЬ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ъ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QΥ
Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local S
Matches 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    present intervening sequable to assemble into all The polymer comprises at intervening oligopeptide The polymer com be used emulsions, coatings, etc materials, catalysts, pu adhesives, cell growth s biological materials. Ty dressings, and in vivo p with good mechanical process provide a ligand for camprovide a ligand for
                                                                                                                                 Collagen-like polymer; prosthetic device; cata
                                                                                                                                                                                        Collagen-like
                                                                                                                                                                                                                                                                   W57646;
                                                                                                                                                                                                                                                                                                    W57646 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Novel DNA sequence repeating units of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Example 3; Columns 101-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DNA encoding protein con-
linked by oligopeptide w
wound dressings
                                                      US5773249-A.
                                                                                                                                                                                                                             27-AUG-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           chemically reactive
                                                                                                                                                                                                                                                                                                                                                                                                                                        319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     156
                                                                                                                                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
les 131; Conser
                                                                                                                                                                                                                                                                                                                                           12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         glpgpkgdrgdagpkgadg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VFPTPPGPPAPPEPNSSPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         agpkgadgspgpagpvgsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ahppfasdp----m
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAPPLPPDPPMPPAIWSAL
                                                                                                                                                                                                                                                                                                                                                                                                ppgpp----gppgppglpg
                                                                                                                                                                                                                                                                                                                                                                                                                                     PPAPPLPYSSPPAPPACPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pgpkgdrgdagpkgadgsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            pgpkgdrgdagpkgadgsp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     P----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PLTLNPPVPPAPPAANTSN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   25.
nilarity 38.
Conservative
                                                                                                                                                                                                                             (first entr
                                                                                                                                                                                        polymer.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA;
                                                                                                                                                                                                                                                                                                    peptide
                                                                                                                               mer; s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         encodi
3-9 al
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a polymer comprising segments of to acids from natural collagen, i.e. the context collagen like protein (CLP)-CB, ed Structures formable into articles, ast 2 segments joined by an unaligned ther than the repeating unit. It is a segment of the segments of the segments of the segments of the segments of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the segment of the
                                                                                                                                 thetic polymer; ic substance.
                                                                                                                                                                                                                                                                                                        357
                                                                                                                                                                                                                                                                                                                                                                                              jdrgdagpkgadgspgp 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPAAPLPGPSPPAPPAPPLPNSPAAPPGPPAWPGAPD 318
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         эд----ррдррдррдрр----дардррдррдррдррд 125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPR-- 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gpvgspgapgppgppgppgppgpgppgppgppgp--p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VPPFPPAEPETPNPPAPPAPPLENSPPPPPVPPVPPVP 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gppgppgppgppgapgppgppgppgppglpgpkgdrgd 74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gpvgspgapgppgppgppgppgppgppgppgppgl 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -gpagpvgspgapgpppp----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  71pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         repeated fibroin derived cell adhesion properties
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 560; DB 17;
Pred. No. 1.8e-24;
7; Mismatches 126;
                                                                                                                                                                                                                                                                                                        AA
                                                                                                                                                                                                                                                                                                                                                                                                                                     -GAPLAPLP 346
                                                                                                                                                   fibre coating;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 357;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -gppgp---pgapg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         segments
useful, (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         e.g.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
```

258

Ξ

12;

243

292

δõ В QΥ Вþ δ B

В δÃ рь οy В δÃ В

ф

```
RESULT 13
R93254
ID R93254
XX
                                                                                                                                                                                           δõ
                                                                                                                                                                                                                             В
                                                                                                                                                                                                                                                                                             Дδ
                                                                                                                                                                                                                                                                                                                           δÃ
                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                             В
                                                                                                                           δÃ
                                                                                                                                                            뫄
                                                                                                                                                                                                                                                         δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .x2222222222222222
                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This sequence represents a unnatural collage. The first moulded of the invention. The products may be used as films, fibres, moulded objects and admixed with other natural or synthetic polymers or coatings on fibres, films, labware or other surfaces, e.g. prosthetic devices. The polymers may be used for binding a wide variety of specific binding materials, as catalytic substances (where the amino acid sequence may specifically chelate a wide variety of elements), as purification media, composites, laminates or adhesives. They may also be combined with inorganic or organic materials such as carbon fibres, nylon fibres, nitrocellulose, etc., as flask coatings or in synthetic matrices for the growth and study of cells, as affinity columns or as supports for growth and study of cells, as affinity columns or as supports, but may
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  06-NOV-1990;
12-NOV-1991;
05-NOV-1992;
22-DEC-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                02-MAY-1996;
04-NOV-1986;
29-OCT-1987;
09-NOV-1988;
               R93254 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        biological materials. The polymers have collagen-like properties, but may be easily expressed in micro-organisms in high efficiency. The new sequences can be tailored to give the desired properties.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Example 2; Column 23; 93pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1998-387004/33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Cappello J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (PROT-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   02-MAY-1996;
                                                                                                                                319
                                                                                                293
                                                                                                                                                              244
                                                                                                                                                                                                                             186
                                                                                                                                                                                                                                                              199
                                                                                                                                                                                                                                                                                             126
                                                                                                                                                                                                                                                                                                                             156
                                                                                                                                                                                                                                                                                                                                                                                             106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local
                                                                                                                                                                                                                                                                                                                                                      75 agpkgadgspgpagpvgspgapg----ppgppgppgpp----gapgppgppgppgppgl
                                                                                                                                                                                                                                                                                                                                                                                                                           24 ahppfasdp
                                                                                                                                                                                                                                                                                                                                                                                                                                                          48 AAPPLPPDPPMPPAIWSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGSGAPR---
                                                                                                                              PPAPPLPYSSPPAPPACPVP-----
                                                                                                                                                         glpgpkgdrgdagpkgadgsp--gpagpvgspgapgppgpp
                                                                                                                                                                             VFPTPPGPPAPPENSSPPAPPAAPLPGPSPPAPPLPNSPAAPPGPPAWPGAPD
                                                                                                                                                                                                                         pgpkgdrgdagpkgadgspgpagpvgspgapgppgppgppgppgppgppgppgp--p
                                                                                                                                                                                                                                                         PLTLNPPVPPAPPAANTSNSPLRPPAPPAPPLKPGPPAPPMPPAPNSPAAPPSPPSPPVP
                                                                                                                                                                                                                                                                                        pgpkgdrgdagpkgadgspgpagpvgspgapgppgppgpppgppgppgppgppgppgppgl
                                                                                                                                                                                                                                                                                                                                                                                          -----PVPAVP-PMPPAPKRMPALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      etc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROTEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   collagen-like polymers -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ferrari
                                                                                            -gppgppglpgpkgdrgdagpkgadgspgp 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96US-0642255
86US-0927258
87US-0114618
87US-0169429
90US-0609716
91US-079196
92US-079196
92US-0777046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96US-0642255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   POLYMER TECHNOLOGIES
               Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25.3%;
38.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FA;
                                                                                                                                                                                                                                                                                                                                                                                                                        -mgapgppgppgppgpgapgppgppgppgppglpgpkgdrgd
                                                                                                                                                                                                                                                                                                                           PSPPVPPFPPAEPETPNPPAPPAPPLENSPPPPPVPPVPPVP
               1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 560; DB 19;
Pred. No. 1.8e-24;
7; Mismatches 126;
                                                                                                                            -GAPLAPLP 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 useful for making gels, films
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                         --dbbdb--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          74;
                                                                                                                                                            pgapg
                                                                                                                                                                                             318
                                                                                                                                                                                                                             243
                                                                                                                                                                                                                                                                                             185
                                                                                                                                                                                                                                                                                                                           198
                                                                                                                                                                                                                                                                                                                                                                                                                           74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12;
```

```
Matches 150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The invention concerns collagen-like polymers having repetitive triads with reduced proline content, and where glycine is the initial amino acid and the subsequent amino acids are varied. The choice of triads utilised in a recombinant collagen-like polymer are chosen in order to affect properties such as helix stability, hydration, solubility, gel point, biodegradation and immunogenicity. Triads of particular interest include GAP, GPP, GAP, GPP, GAS, GPG, GPS, GAQ, GSP, GLQ, GPR, GPK, GAK, GAR, GER, GBP, GDA, GAH and GEA. The collagen-like polymers may impart new characteristics, finding wide used in photographic, medical, structural and fibre applications, and are capable of being produced in unicellular microorganisms at high mol. wts. and in high efficiency. The present sequence, encoded by pPT0176, is a SequenceD gene 3 polymer. The SequenceD collagen-like polymers are used as immunogens for the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   05-NOV-1992;
06-NOV-1990;
12-NOV-1991;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Collagen-like polymers comprising repetitive triads - produced unicellular organisms with improved characteristics, useful in,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       prepn. of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Example 2; Column 21; 43pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               photographic and medical fibres
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Cappello J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    06-NOV-1990;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          05-MAR-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             collagen; repetitive triad motif; recombinant production; photographic; medical; structural; fibre.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Collagen-like
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (PROT-) PROTEIN POLYMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US5496712-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-FEB-1997
                                210
                                                                                                                                                                                                                                                                                                                    114
                                                                                                                                                                                                      174
                                                                                                                                                                                                                                                                                                                                                                             63
                                                                                                                                                                                                                                                                                                                                                                                                                                     54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7 PAPPAPPSPINPPVPPVPPLPAAP----RTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
PPAANTSNSPLRPPAPPAPPLK---PGPPAPPMPPAPNSPAAPPSPPSPPVPVFPT----
                                                                                apgpagppgsrgdpgppgapgpagppgsrgdpgppgahgpagpkgahgpagpkgahgpag
                                                                                                                                                                                                                                                         ALPPAPPAPPSPPTSWLAVPVPPVPPVPPLPVKM-----PPSPPVPPFPP---AEPETPN 173
                                                                                                                                                                                                                                                                                                                                                                          WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGS-GAPRPVPAVPPMPPAPKRMP 121
                                                                                                                                                                                                                                                                                                                                                                                                                               pgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagp 113
                                                                                                                                              PPAPPAPPLENSPPPPPPPPPPPPLTLNPPVPP--
                                                                                                                                                                                                    pgppgapgpagppgs-rgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgppg
                                                                                                                                                                                                                                                                                                                 pgsrgdpgppgapgpagppgsrgdpgppgapgppgsrgdpgppgapgpagppgsrgd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          antibodies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1064 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ferrari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   polymer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   92US-0972032.
90US-0609716.
91US-0791960.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 90US-0609716
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23.8%;
32.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 528.5; DB 17; Pred. No. 2.1e-22; 7; Mismatches 200;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             D gene 3 polymer protein (pPT0176).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1064;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             in,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               u in
e.g.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                    173
```

```
B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δõ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       02-MAY-1996;
04-NOV-1986;
29-OCT-1987;
09-NOV-1988;
06-NOV-1990;
                         This sequence represents a unnatural collagen-like polymer of the invention. The products may be used as films, fibres, moulded objects and admixed with other natural or synthetic polymers or coatings on fibres, films, labware or other surfaces, e.g. prosthetic devices. The polymers may be used for binding a wide variety of specific binding materials, as catalytic substances (where the amino acid sequence may specifically chelate a wide variety of elements), as purification media, composites, laminates or adhesives. They may also be combined with inorganic or organic materials such as carbon fibres, nylon fibres, nitrocellulose, etc., as flask coatings or in synthetic matrices for the growth and study of cells, as affinity columns or as supports for biological materials. The polymers have collagen-like properties, but may be easily expressed in micro-organisms in high efficiency. The new sequences can be tailored to give the desired properties.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Collagen-like polymer; synthetic polymer; fibre coating; prosthetic device; catalytic substance.
                                                                                                                                                                                                                                                                                                Recombinant collagen-like polymers – useful for making gels, fibres, etc.
                                                                                                                                                                                                                                                                                                                                                                             Cappello J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US5773249-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Collagen-like polymer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  W57652 standard; peptide; 1064
                                                                                                                                                                                                                                                                                                                                                                                                          (PROT-) PROTEIN POLYMER TECHNOLOGIES INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   02-MAY-1996;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  30-JUN-1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       27-AUG-1998 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                          12-NOV-1991;
05-NOV-1992;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               agppg---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       - gapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  dpgppgapgp-agppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgpp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PPGPPAPPEPNSSPP---APPAPPAAPLPG-----PSPPAPPAPPLPNSPAAPPGPP 311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGRPSNSWVGVFTMLSRPSNGAAAAASALAYAPAPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       pkgahgpagpkgapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrg
                                                                                                                                                                                                                                                                    3; Column 32; 93pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                       96US-0642255

86US-0927258

87US-0114618

87US-0114618

98US-0269429

90US-0609716

91US-0791960

92US-0791960

92US-077046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96US-0642255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --srgdpgppg----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ĄΑ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -apgpa 489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             383
                                                                                                                                                                                                                                                                                                                  films
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                352
```

```
γQ
                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                           QY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QУ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Вb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DЪ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QΥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
(PROT-) PROTEIN POLYMER
                   12-NOV-1991;
                                     04-NOV-1992;
                                                                                                          Protein
                                                                                                                                                                  Key
Protein
                                                                                                                                                                                             Synthetic
                                                                                                                                                                                                                         Recombinant; fibre; film;
                                                                                                                                                                                                                                                      Collagen-like
                                                                                                                                                                                                                                                                          07-SEP-1993
                                                                                                                                                                                                                                                                                                             R37741 standard; Protein
                                                         27-MAY-1993
                                                                             WO9310154-A.
                                                                                                                           Protein
                                                                                                                                                Protein
                                                                                                                                                                                                                hydrogel;
                                                                                                                                                                                                                                                                                                                                                                                                      412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           174
                                                                                                                                                                                                                                                                                                                                                               471
                                                                                                                                                                                                                                                                                                                                                                                  348
                                                                                                                                                                                                                                                                                                                                                                                                                                          353
                                                                                                                                                                                                                                                                                                                                                                                                                                                             263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    63
                                                                                                                                                                                                                                                                                                                                  15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7 PAPPAPPSPINPPVPPVPPI
                                                                                                                                                                                                                                                                                                                                                               agppg-----srgd
                                                                                                                                                                                                                                                                                                                                                                                                   gapgpagppgsrgdpgppg
                                                                                                                                                                                                                                                                                                                                                                                                                       AWPGA-----PDPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                        dpgppgapgp-agppgsrg
                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPGPPAPPEPNSSPP---A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               pkgahgpagpkgapgpagp)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PPAANTSNSPLRPPAPPAP!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     apgpagppgsrgdpgppga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           pgppgapgpagppgs-rgdj
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ALPPAPPAPPSPPTSWLAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pgsrgdpgppgapgpagpp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WSALEAPNPPVPPAPPGPN:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      pgpagppgsrgdpgppgap
                                                                                                                                                                                                                                                                                                                                                                                 SGRPSNSWVGVFTMLSRPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PPAPPAPPLENSPPPPPVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                               ant; collagen-li
ilm; coating; tr
interchain lin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                         (first entr
                                                                                                                                                                                                                                                      polymer
                   91US-0791
                                      92WO-US09
                                                                                                                           /label=
538..789
                                                                                              /label=
790..104
/label=
                                                                                                                                                                  Location 34..285
                                                                                                                                                /label=
286..53
                                                                                                                                                                                                                                                      B
                  ٠.
CHNOLOGIES INC.
                                                                                                3
                                                                                                               3
                                                                                                                                    3
                                                                                                                                                                                                                                                                                                               065
                                                                                                                                                         ·Ϋ́
                                                                                                                                                                           alifiers
                                                                                                                                                                                                               polymer; CLP; tripeptide; helix; membrane; sequence; collagen; mammalian; moulding; e; colloid suspension; DCP; antibody.
                                                                                                                                                                                                                                                                                                                                                             )pg-----apgpa 489
                                                                                                                                                                                                                                                                                                                                                                                 AAAASALAYAPAPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     agppgsrgdpgppgahgpagpkgahgpagpkgahgpag
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPMPPTPPLPPVPPGS-GAPRPVPAVPPMPPAPKRMP 121
                                                                                                                                                                                                                                                                                                                                                                                                 |pagppgsrgdpgppgapgpagppgsrgdpgppgapgp-
                                                                                                                                                                                                                                                                                                                                                                                                                       PYSSP----PAPPACP-----VPGAPLAPLPI
                                                                                                                                                                                                                                                                                                                                                                                                                                         ppgapgpagppgsrgdpgppgapgpagppgsrgdpgpp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               {rgdpgppgapgpagppgsrgdpgppgapgpagppgsrg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ---PGPPAPPMPPAPNSPAAPPSPPSPPVPVFPT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PVPPLTLNPPVPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         pgapgpagppgsrgdpgppgapgpagppgsrgdpgppg 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PVPPVPPLPVKM----PPSPPVPPFPP---AEPETPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                             PPAAPLPG------PSPPAPPAPPLPNSPAAPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gdpgppgapgpagppgsrgdpgppgapgpagppgsrgd 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gppgsrgdpgppgapgpagppgsrgdpgppgapgpagp 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AP----RTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI
                                                                                                                                                                                                                                                    encoded by clone pPT 0176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 528.5; DB 19;
Pred. No. 2.1e-22;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 1064;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----A
                                                                                                                                                                                                                                                                                                                                                                                                                                          411
                                                                                                                                                                                                                                                                                                                                                                                                                                                             311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      292
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17;
```

K

```
Qy
                                                                                                                                                 DЬ
                                                                                                                                                                                 Qγ
                                                                                                                                                                                                                                                           QΥ
                                                                                                                                                                                                                                                                                               В
                                   δÃ
                                                                                                                                                                                                                                                                                                                               Qy
                                                                                                                                                                                                                                                                                                                                                                   В
                                                                                                                                                                                                                                                                                                                                                                                                     Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                           DЬ
     밁
                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Qy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Дb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ρ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local S
Matches 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This sequence is an example of a recombinantly produced DCP3 collagen-like polymer (CLP) which consist of repeated tripeptide sequences selected from a wide range of GXY sequences, where X and Y can be any amino acid. The DNA encoding this sequence was cloned into plasmid pPT 0176 and used to transform E. coli. DCP peptides comprise repeated units of; A = GAPGPAGPP, B = GSRGDPGP and/or C = GAHGPAGPK. These polymers have molecular weights of >30 kD and are able to form helices due to interchain linkages. These polymers pref. contain a proportion of tripeptide triad sequences found in natural collagens, pref. mammalian collagens. The CLPs impart unique characteristics to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mammalian collagens. The CLPs impart unique characteristics to materials such as fibres, membranes, films, coatings, hydrogels, colloid suspensions and moulded articles.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Disclosure; Page 48; 82pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               High mol. wt. collagen-like protein polymers - capable of being
produced in unicellular microorganisms
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Cappello J,
                                                                                                                                                                                                                                                                                               233
                                                                                                                                                                                                                                                                                                                                                                                                           122
     471
                                     348
                                                                           412
                                                                                                             312
                                                                                                                                                 353
                                                                                                                                                                                                                                                                                                                                                              174 pgppgapgpagppgs-rgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgppg
                                                                                                                                                                                                                         293
                                                                                                                                                                                                                                                         210 PPAANTSNSPLRPPAPPAPPLK----PGPPAPPMPPAPNSPAAPPSPPSPPVPVFPT----
                                                                                                                                                                                                                                                                                                                               174 PPAPPAPPLENSPPPPPVPPVPPVPPLTLNPPVPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                     114 pgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrgd 173
                                                                                                                                                                                 263 PPGPPAPPEPNSSPP---APPAPPAAPLPG-----PSPPAPPAPPLPNSPAAPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local Similarity
nes 150; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7 PAPPAPPSPINPPVPPVPPLPAAP----RTLSPPVPPAPPSPISLAAPPLPPDPPMPPAI 62
                                                                                                                                                                                                                   pkgahgpagpkgapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrg 352
                                                                                                                                                                                                                                                                                        apgpagppgsrgdpgppgapgpagppgsrgdpgppgahgpagpkgahgpagpkgahgpag
                                                                                                                                                                                                                                                                                                                                                                                            ALPPAPPAPPSPTSWLAVPVPPVPPVPPLPVKM-----PPSPPVPPFPP---AEPETPN 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                WSALEAPNPPVPPAPPGPNSAPAPPMPPTPPLPPVPPGS-GAPRPVPAVPPMPPAPKRMP 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             pgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgpagp
agppg--
                                     SGRPSNSWVGVFTMLSRPSNGAAAAASALAYAPAPA 383
                                                                      gapgpagppgsrgdpgppgapgpagppgsrgdpgppgapgppgsrgdpgppgapgp- 470
                                                                                                               AWPGA--
                                                                                                                                            dpgppgapgp-agppgsrgdpgppgapgpagppgsrgdpgppgapgpagppgsrgdpgpp 411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1065 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ferrari
                                                                                                             -PDPPAPPLPYSSP--
 -srgdpgppg---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 528.5; DB 14; Length 1065; Pred. No. 2.1e-22; 7; Mismatches 200; Indels 99;
 -apgpa
                                                                                                             -PAPPACP---
 489
                                                                                                           -VPGAPLAPLPI 347
                                                                                                                                                                                                                                                                                                                               ----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps \
                                                                                                                                                                                                                                                                                                                                                                   232
                                                                                                                                                                                 311
                                                                                                                                                                                                                                                                                             292
                                                                                                                                                                                                                                                                                                                                 209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 113
                                                                                                                                                                                                                                                           262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       17;
```

Search completed: January Job time: 206 sec

5

2001,

14:26:49

THIS PAGE BLANK (USPTO)